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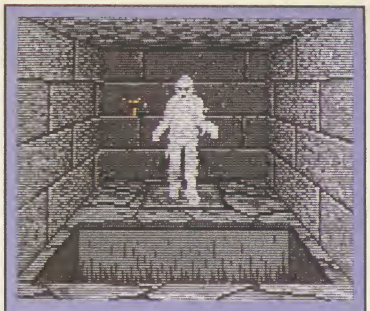
Issue 23 • Apr 15 1989

New classified section! – page 18

NEW COMPUTER EXPRESS

First news, first reviews – every week



DUNGEON MASTER

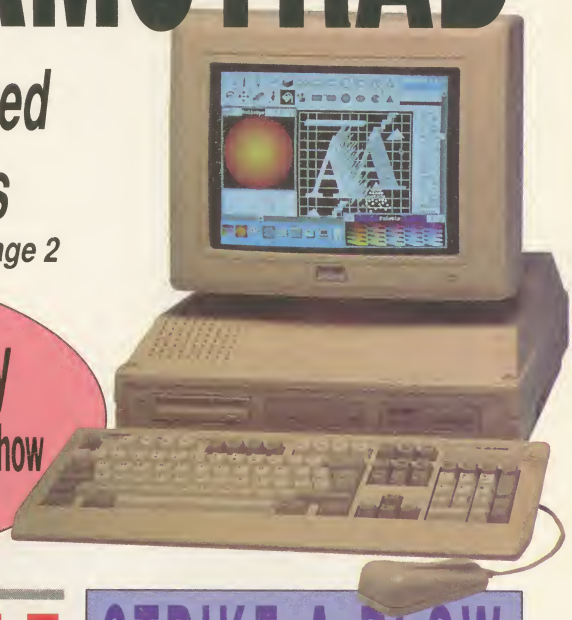
Why the best selling ST game won't be out on the Amiga 500 page 3

Buying a computer? The best sub-£500 machines chosen for you page 15

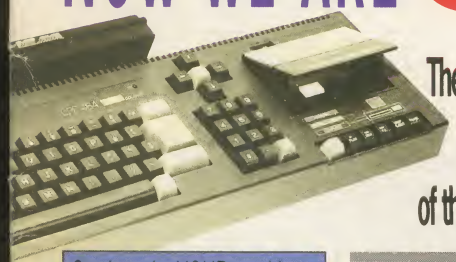
BUG SHOCKER HITS AMSTRAD

MS DOS 4 replaced on top range PCs

page 2



NOW WE ARE 5



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Alternative strategy

Report on the "other micros" show

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The BEST in console software

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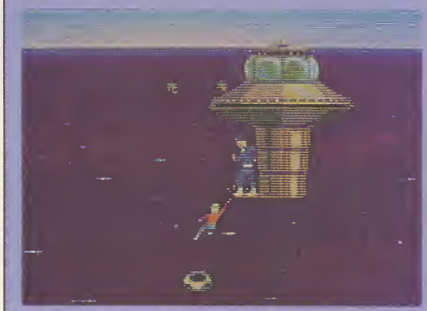
STRIKE A BLOW



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MORE HARD LUCK FOR AMSTRAD

• Hard life: More problems for Amstrad with PC hard disks

Amstrad's up-market PCs have been once more dogged by problems – their second major computer headache this year.

The hard disks on their 2386 machines had been giving inexplicable read-write errors. Earlier this year some of its PC2086 range had also been giving problems due to a faulty hard disk controller. Amstrad had to ship out thousands of small parts – worth two pence – to rectify the problem.

Many pundits took this as an indication of Amstrad's growing interest in other projects such as satellite TV and a gradual shift of emphasis away from the computer side.

Now Amstrad has tracked down the 386 fault. It was not due to hardware, but to a bug in MS-DOS version 4, it announced this week. Read failures occur whenever parts of the disk separated by exactly 32MB are accessed in close succession.

Chairman Alan Sugar said the decision to use Microsoft's current state-of-the-Art MS-DOS 4 – which works on a GEM-like windows and icons interface – had backfired "through no fault of our own".

"I am upset that until now our 386 has not earned the reputation is deserves, when in fact our hardware has proved to be very reliable and the problem has been caused by Microsoft's MS-DOS 4," he added.

Microsoft's Bill Inglis commented: "There were a few bugs on version 4 of MS-DOS, not just on the 386 but on all the machines using it. This one only becomes apparent under relatively unusual circumstances and was pointed out to us by Amstrad."

Amstrad's Nick Hewer told *Express*:that no customers had been affected by the problem. "We have fixed the bug ourselves with the approval of Microsoft and have shipped the amended version of DOS 4 to our dealership."

Amstrad has had to move very quickly to fix things in order to keep up its hopes of dominating the serious end of the PC market. While its grip on the small business and home user has been very strong through the PC1512 and PC1640, it has not had a significant effect on the top end of the market.

Printer problems

Mannesman Tally's MT222 – a 24 pin printer offering "far superior" print quality – has been put on 'technical hold' with as many as one in twenty being unuseable.

This effectively means the printer is unfit for sale and is being recalled. Peter Pratt of MT's UK sales team said "about 1 in 20 were unusable. Rather than tarnish our reputation, we decided to contact our parent company in Germany and get a permanent solution. We are trying to trace them and are resupplying MT230s, with a higher specification. But people just won't let go of their MT222s".

Chris Hewitt of MT said the trouble was that "the UK has higher standard than many coutnries. It's been selling well overseas'.

When the printer is available again, it will be £695 plus VAT and claims a speed of 72 cps – over twice that claimed for the Amstrad LQ3500. MT is on 0734 788111.

• Hold it: MT222 hits problems

I CAN C THE LIGHT

Already spoilt for choice in the field of graphic packages, Amiga owners now have another graphics package to look at. C-Light is a 3D real-time animator – using multiple light source ray tracing techniques – for the Amiga priced at £49.95. Further details from Artronic Systems on 0423 525325.

• Room for manoeuvre: New animation package for the Amiga

SCRAMBLED EGOS

If you feel you can't manage because you don't understand people, Ivy Software's new program could be what you're looking for.

How to Manage People Effectively is the latest in a line of management skills training packages for the PC. It claims to provide users with 'a practical model of personality enabling them to develop much greater understanding of their own and others' personal behaviour.' It also explains the building blocks of personality and ego states and promises to improve managerial performance.

• What us? Miss out on Gorbiemania. No chance.

The Soviet number one took the time out during his visit to the UK to take a look around network specialist CASE's Watford plant. The area is a Government backed demonstration site for Computer Aided Design (CAD) applications. According to CASE's top brass the Soviet president is keen to see computers being used in industry.

SCRAPPED

Mirrorsoft drops A500 Dungeon Master plans

Contrary to repeated assurances that a version of *Dungeon Master* would be made available for Amiga A500 owners, Mirrorsoft – distributing the program on behalf of FTL in Europe – has had to abandon the project.

The majority of Amiga owners will now not have the chance to try the arcade adventure that instantly became a classic and has become the biggest selling game on the ST.

Paul Boelhaus, FTL's marketing manager in the States, *told Express*, "We went to great lengths to fit *Dungeon Master* into the standard A500. We reduced the amount of graphics and sound became almost non-existent, but even this effort was unacceptable". Boelhaus cited the Amiga's memory management and allocation procedures as the main cause behind FTL's difficulties in fitting everything in. He added: "We know it looks at though we're abandoning the standard A500 user, but this is far from the truth. This has been a painful decision for us."

• Dungeon Master: No Amiga 500 version – and that's official

FTL has several projects under development in the US at the present, including *Chaos Strikes Back* – an expansion disk for *Dungeon Master* incorporating a graphics editor, allowing users to change their on-screen character representations – due for worldwide release on the ST next month.

Obviously, as *Chaos Strikes Back* will not run without *0* , unexpanded A500 users won't be able to use this FTL title either. FTL is said to be working on *Dungeon Master II* but 'no details are available at present'.

"Naturally we are extremely disappointed," Mirrorsoft's Cathy Campos told *Express*. "The reason is FTL's committment to quality – they didn't want to compromise their standards for commercial considerations. If we could have released a version for the Amiga 500, we would have cleaned up."

Mirrorsoft had been most confident that FTL would be able to fit the game on the A500. Last February the firm told *Express* that it was due to be out this month. Suggestions that it would not materialise were hotly denied by Mirrorsoft at the time.

In the UK only about 10% of Amiga 500 owners have had the memory upgrade enabling them to run 1 meg games such as *Dungeon Master*.

DHSS TO INTRODUCE COMPUTERS

'Expert system' computers which can give unbiased advice to social security claimants have been demonstrated in London this week.

Logica, which specialises in developing expert systems, unveiled its 'Advice System' after five years of work. Social security claimants who want to avoid the embarrassment of personal interviews are said to need no computer knowledge to use the system and can ask the computer direct questions such as 'Can I claim Child Benefit?'. "It's quite an easy system, written in everyday language" said Logica's Lorette Nettar. "You can even ask it things like 'Why not?' or 'What's this got to do with it?'".

The system won't be installed until it has undergone a few years of tests to see how people would take to it.

Scanner scam

The public is being misled over the specification of some scanners, it was claimed last week.

With the scanner market exploding at up to 25% growth per month, prices are beginning to come down making the market reachable by the home and small business user. But, claims scanner distributer Cameron MacSween, double talk is also creeping in in the form of dots.

"Mitsumi of Japan make the only commercially available scanner that can produce 300 to 400 dots per inch across the scan," he told Express. But some manufacturers, he said, omitted to tell the truth about some other scanners such as some of those made in Japan which can only simulate 400 dpi by duplicating a 200 dpi scan. "The manufacturers represent their product correctly in all their literature. Not so with the marketeers," he said.

The Atari-compatible Type 4 scanner, available now, is a true 400 dpi scanner. "With a glass or two of whisky," said MacSween, "you may imagine it capable of 800dpi!".

• Scan and deliver: How scanners can be daylight robbery

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NEW COMPUTER EXPRESS

COMMENT

Summer better than others

The casual reader might be forgiven for thinking that two stories in these pages are contradictory. On the one hand we read about Amstrad's problems with faulty hardware; one the other we are told that dealers quite clearly see Amstrad as making the most reliable machines (though they also see Amstrad's ad campaigns as 'very good', a view not universally held).

The solution to the paradox is simple. Amstrad's main business has been, and still is, in the home sector – Alan Sugar's famous lorry driver who bought the CPC, five years old this week, and still going strong. In that, it has proved unbeatable: sturdy machines, reasonable specifications – and most importantly cheap prices that anyone can afford. The machines featured in the survey were Amstrad's old favourites: CPC, PCW, PC1512 and PC1640. These are the reliable, no-nonsense machines that were developed in the pre-satellite, pre-top-end PC days. (Though the survey doesn't mention the PC200's distribution foul-ups last year, or the problems with the German PCWs).

The top end stuff – Amstrad's PC 2086, 2286, 2386 – were not included, since they're still not widely available. These are the machines that represent Amstrad's sortie into the 'serious' business market, the land currently dominated by IBM with everyone else nowhere. And these are precisely the ones that have caused Amstrad problems.

Whatever the cause of the problems were before, this time Amstrad can quite legitimately plead Not Guilty and point to the fact that it found and corrected someone else's bug itself, and has rectified things with laudable speed. But one swallow doesn't make a summer, as the recent April snow showed; equally, the undoubted reliability of the CPCs and PCWs does not guarantee Amstrad sunshine in the business sector.

A-Z of knowledge

A forewarning that next week Express is starting a major new series of articles which will build week-by-week into a definitive encyclopaedia of computing. A is for Acorn, Amstrad, Atari, Activision, Apple, ACE, Amiga, Abacus, ATW, Asteroids, Ada... Don't miss it.

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TELECOMSOFT SNAFFLED UP

In what is certain to be the biggest deal of its kind, MicroProse is set to complete the purchase of Telecomsoft in the next two weeks, *Express* can reveal.

• Byrne: Telecomsoft sold

The rights to all products on the Rainbird, Firebird and Silverbird labels will pass over to the American firm. Some 180 already releasable versions of new games are included: Telecomsoft has been holding back on some titles, pending the deal.

But it is understood that MicroProse has not as yet secured the rights to publish any new Magnetic Scrolls' games. This jewel in Telecomsoft's crown is being negotiated as a separate agreement.

Telecomsoft's budget games and back catalogue rights are almost certain to be sold to Virgin Mastertronic, since MicroProse has little immediate interest in the cheapos market. Virgin said that it had decided against bidding for the full company primarily because of the high guarantees given to programmers.

The deal is said to be costing MicroProse in excess of £2 million, and follows some months of protracted discussion, in which it just headed off the French firm Ubisoft. Initially, it was expected that Telecomsoft's boss Paula Byrne would lead a management buy-out. But MicroProse's interest upped the price and Byrne had to pull out.

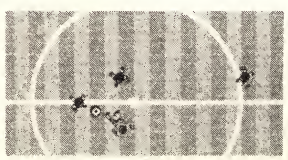
Byrne will not be joining the US firm, due to "a totally mutual lack of desire to work together", according to one well-placed figure. The apparent displeasure felt by Telecomsoft staff that MicroProse had won the battle will not prevent the majority of them from moving over.

CHEAP SOMETHING

A new program allowing you to work a PC by remote control from another over the telephone lines is available at a special price from Acton Computer Supplies. This allows users to work their office PCs from home, for example, giving them access to their business programs and database. Carbon Copy Plus costs £97.50; Acton is on 0800 333 333.

This is your lifestyle

Apart from the Telecomsoft scoop MicroProse is to launch two new labels aimed at specific 'lifestyles' of the games market. And one of their first releases will be an antidote to all those violent shoot-'em-ups – a Greenpeace game.



• 16-bit soccer, Greenpeace and new labels

Both labels will be 16-bit led and few, if any, 8-bit games are expected to feature in the forthcoming releases. Microstyle will target its games at the 'aspirational' late teens age group, including racing sims and shoot-'em-ups. The first release will be a motorbike sim produced in association with Joey Dunlop.

Microstatus aims at the more affluent buyers in their middle twenties and will include the Incentive titles it signed up, as reported in *Express* last week, and 'more detailed' games. The first release will be a Greenpeace game. Out to coincide with the launch of the well-publicised Greenpeace rock album that has already brought the likes of Annie Lennox, Peter Gabriel and Sting to Russia, the game features environmentally aware activities such as sabotaging seal culls by spraying seals with green paint before the Eskimoes can catch them, to make the pelts worthless.

"Within our sphere of military simulations, we were the best, but now we're trying to broaden our horizons across the market spectrum," said Microprose's Martin Moth. "So we're tailoring the two new labels towards two particular types of buyers."

Both new games will be out on ST, Amiga and C64 in May.

MicroProse will also be bringing out a 16-bit version of its soccer sim in the middle of this month. *MicroProse Soccer* will be £24.95 for the ST and Amiga.

Virus help

After the news last week that a non-profit making organisation to help computer users fight viruses, COTRA, has been set up, comes an incentive for people who think they've got solutions to the virus problem.

The Institute of Chartered Accountants is offering an IBM PS/2 50Z, printer and software, for the 'best initiative for preventing, curing or combating them'. Details from Nikki Muggridge on 01 628 7060.

COTRA – the Computer Threat Research Organisation – can be contacted on 0836 865944, or at 144 Sheerstock, Haddenham, Bucks HP17 8EX.

FIFE GO MAD...ON MACS

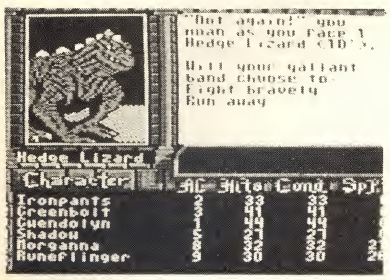
The domination of Acorn machines such as the BBC and Archimedes in British schools is being challenged. Schoolchildren in Fife will be able to use Apple Macintoshes from May for their projects and general school work.

Fife Regional Council has placed an order worth half a million pounds to place Mac IIs and SEs and laser writers in every school in the region, from the smallest primary school with nine pupils to the largest secondary school.

• Fife schools to get Mac attack

The Macs – which cost several thousand pounds each – were chosen, said a spokesperson, for their "consistent and easy to use interface".

ELECTRONIC ARTS SOFTWARE CLASSICS


"Not again!" you moan as you face the Hedge Lizard CHIEF.
Will your gallant band choose to Fight bravely Run away
Hedge Lizard
Character
AC Hits Cond. Spl
Ironpants 3 33 33
Greenbolt 3 41 41
Gwendolyn 1 40 40
Shadow 1 41 41
Morgana 2 32 32
Runeslinger 9 30 30

• Classical training: Half-price games from Electronic Arts

Games house Electronic Arts is re-releasing some of its best-selling titles at under half-price. The Software Classics range will feature award-winning hits such as *The Bard's Tale*, *Marble Madness* and *Chessmaster 2000*.

The ten titles will be released in May, each costing £9.99 for ST, Amiga and IBM PC, £6.99 for 8 bit disks and £2.99 for 8 bit cassettes.

Tim Mott of Electronic Arts commented "These are established, award-winning products – true classics – now at half price or less". The titles are: *The Bard's Tale*; *Chessmaster 2000*; *Marble Madness*; *Skyfox II*; *World Tour Golf*; *Earth Orbit Stations*; *Articfox*; *Legacy of the Ancients*; *Music Construction Set*; and the *Archon Collection*.

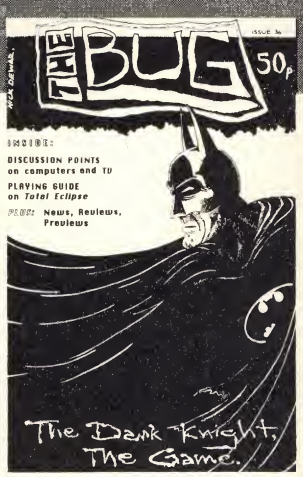
This comes two weeks after Ocean announced its first budget game. Games players will be hoping this is another sign of cheaper 16-bit games to come.

FOR A FEW THOUSAND DOLLARS MORE

Steve Jobs' much publicised NeXT workstation – touted as the next step up from Jobs' Apple Macintosh that has become the standard machine in America – will go on sale to the public next month in America's Businessland stores.

But don't rush over until you've upped your credit card limit a little. The price will be $9,995 – $3,500 more than educational institutions have to pay.

LAST GASP FOR THE BUG



• The Bug's last bite: but it's going out with a bang

All good things come to an end. *The Bug*, Britain's best-loved computer fanzine, is winding down after 36 issues – because its writers are going to university.

The magazine started in Muswell Hill in London in 1984, covering the Spectrum, Amstrad and Amiga in a characteristically 'alternative' style. "We thought the glossy mags weren't providing an accurate view of the software world, so we decided to publish and put our views across," said co-editor Jeffrey Davey. The first issue was duplicated, cost 15p, and had a circulation of 50. The radical approach caught on and in its heyday *The Bug* sold over 1500, and even had sponsorship for a while.

Davey is hoping to study Politics and Philosophy at Reading and co-editor Jaron Lewis is going to Nottingham University. "Five years is a fair whack," said Davey, "and with the other editor, Kelsey Lewis, moving to Exeter it would be difficult to continue". They intend to carry on writing freelance for other computer magazines.

The final celebration issue will be professionally printed, cost 55p, and feature awards and articles by all *The Bug*'s writers over its five-year history. It will also have a British fanzine first – a cover mounted cassette.

SKWEEKY CLEAN UP

***Skweek!* is the first game from French software company Loriciels since it split from Elite three months ago. Casting the player as a "furry orange bundle of fun" in a derivative of the classic *Pacman*, *Skweek!* is due for release next month, via US Gold, on CPC, ST, Amiga and PC – no price has yet been fixed for this wee beastie.**

Cheats on CPC

A new software house is specialising in cheating – and it's being run by a teacher.

Chris Price came down hard on any of the kids in class he found cheating, but now he's heading 1st Choice Software, whose first two releases are cheat compilations for some of the more popular CPC games.

***Choice Cheats 1* gives details of infinite lives and immunity for *By Fair Means or Foul*, *Cybernoid*, *Operation Wolf*, *Karnov*, *Flying Shark*, *Radius*, *Tanium*, *Advanced Pinball Simulator*, *Joe Blade II*, *Star Trooper*, and *Chang Hai Karate*.**

***Choice Cheats 2* covers *Bad Bude V*, *Dragon Ninja*, *Hopper Copper*, *Arkanoid*, *Arkanoid II*, *Dynamite Dan*, *Solomon's Key*, *Dizzy 2*, *ATV Simulator*, *Empire Strikes Back*, *Pro-Ski Simulator*, *Batman and Head Over Heels*.**

Price left teaching to become a full-time programmer and worked on games like *Micro Olympics* and *Red Arrows* as well as some of the most successful 'serious' software for the CPC including *Mini Office* and *Fun School 2* – an educational package which is selling so well it has made the games charts.

He said of the Cheat compilations "This sort of cheating doesn't do anybody any harm. In fact it's more like helping them with their homework". *Cheats 1* on disk will cost £4.99, *Cheats 2* on tape £2.99; details on 0706 72728.

TOP 20 *Full Price* GAMES

1	**Robocop** OCEAN *Spectrum, C64, CPC, ST, Amiga*	1	
2	**Dragon Ninja** OCEAN *Spectrum, C64, CPC*	2	
3	**WEC Le Mans** IMAGINE *Spectrum, C64, CPC, ST, Amiga*	7	
4	**Operation Wolf** OCEAN *Spectrum, C64, CPC, ST, Amiga*	5	
5	**Middle Earth** MELBOURNE HOUSE *Spec, C64, CPC, ST, Amiga, PC*	6	
6	**Emlyn Hughes** AUDIOGENIC *Spectrum, C64*	4	
7	**In Crowd** OCEAM *Spec, C64, CPC*	3	
8	**Fun School 2** DATABASE/MANDARIN *Spectrum, C64, CPC, ST, Amiga, BBC*	17	
9	**Afterburner** ACTIVISION *Spectrum, C64, CPC, ST, Amiga*	8	
10	**Football Manager 2** ADDICTIVE *Spectrum, C64, CPC, ST, Amiga, PC*	17	
11	**Double Dragon** MELBOURNE HOUSE *Spectrum, C64, ST, Amiga, PC*	10	
12	**Pacland** GRANDSLAM *Spectrum, C64, CPC, ST, Amiga, MSX*	11	
13	**Run the Gauntlet** OCEAN *Spectrum, C64, CPC, ST, Amiga*	RE	
14	**Giants** US GOLD *Spectrum, C64, CPC*	RE	
15	**Renegade 3** IMAGINE *Spectrum, C64, CPC*	RE	
16	**Thunder Blade** US GOLD *Spectrum, C64, CPC, ST, Amiga*	14	
17	**Batman** OCEAN *Spectrum, C64, CPC, ST, Amiga*	13	
18	**R-Type** ELECTRIC DREAMS *Spec, C64, CPC, ST, Amiga*	20	
19	**Arcade Muscle** US GOLD *Spectrum, C64, CPC*	9	
20	**Gary Lineker** GREMLIN *Spectrum, C64, CPC*	RE	

TOP TEN *Budget* GAMES

1	**Treasure Island** CODE MASTERS *Spec, CPC*	3
2	**Twin Turbo V8** CODE MASTERS *Spec, CPC*	RE
3	**Joe Blade 2** PLAYERS *Spectrum, C64, CPC, BBC, Electron, C16*	4
4	**Super Cycle** KIXX *Spectrum, C64, CPC*	5
5	**Ghostbusters** MASTERTRONIC *Spectrum, C64, CPC, Atari 8-bit*	7
6	**Spy Hunter** KIXX *Spectrum, C64, CPC*	3
7	**World Games** KIXX *Spectrum, C64, CPC, MSX*	9
8	**Street Gang** PLAYERS *Spectrum, C64, CPC*	10
9	**Turbo Esprit** ENCORE *Spec, C64, CPC*	1
10	**The Double** ALTERNATIVE *Spectrum, C64*	5

RE re-entry • NE new entry • Last week's positions
Compiled by Gallup

The charts shown are based on the Open Market, that is retailers who stock a broad range of products. All charts shown are copyright of Gallup.

DEALERS BACK JAPS AND AMSTRAD

A survey of the UK's main computer retailers has revealed that most of them see Amstrad and Japanese-made hardware as the most reliable. Amstrad also rates best on technical support and backup, though this is generally considered bad.

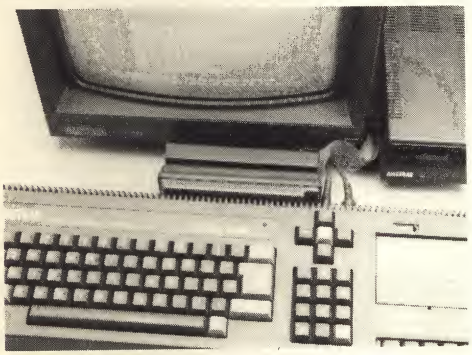
The survey, which was carried out by newspaper *Computer Trade Weekly*, revealed that no retailers believed more than 1 in 8 of their Sega or Nintendo consoles were faulty. Only a few dealers reported the same figure for the Amstrad PCW and none reported faults higher than 1 in 8 for the five-year-old CPC, which was seen as the most reliable machine apart from the consoles.

On the other hand, more than 1 in 8 Spectrums (a hang-over from pre-Amstrad days) were thought of as faulty by 40% of dealers, with C64s and 128s hitting a similar figure.

The same survey showed the Amstrad PCW was the most widely available machine, being stocked by three-quarters of dealers, with the PC1512 and PC1640 notching over 60%. The Amstrad PPC was the most widely available portable.

Technical support and backup was rated by the overwhelming majority of dealers as 'fair' to 'poor' for Acorn, Commodore and Atari, and 'not very good' to 'good' for Amstrad. Over half those interviewed thought Amstrad's ad campaigns were 'very good', everyone else being rated 'fair' to 'good'.

The sample was not weighted and did not claim to be definitive market research, but included information from over 350 dealers.



• Faithful Arnold: Dealers say CPC is the most reliable computer

Common Commodore

There are going to be more Commodore machines in the High street soon. 258 Tandy stores across the country will be stocking the C64 Hollywood pack, 20 John Lewis computer stores are taking the Amiga and toy chain Hamley's is 'committed' to Commodore machines.

VIDEO STAR

Hot Shot Entertainments Action – the video that gives you snippets of the forthcoming games releases of the month, as featured in *Express* news in issue 21 – is coming down in price.

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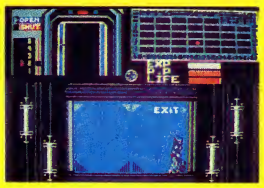

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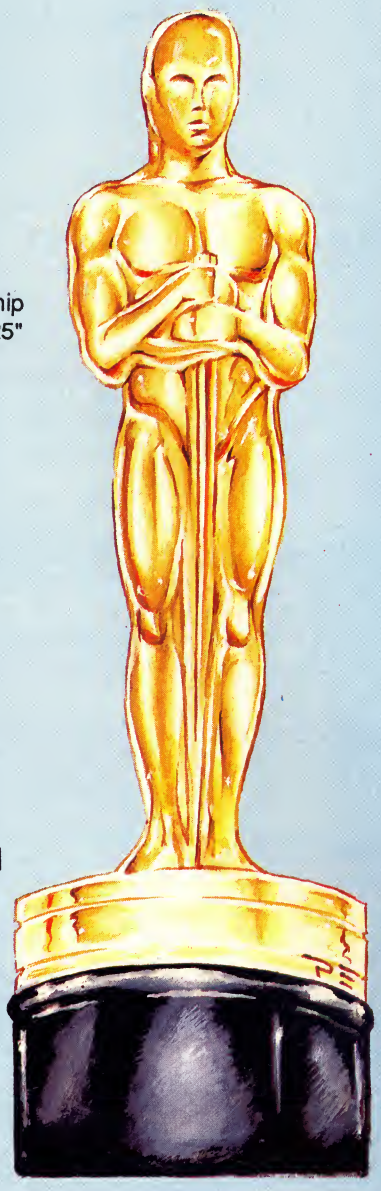

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Dear Reader

More pages packed with another selection from our postbag and Rob Ainsley's replies. Have you got something to say? Make your voice heard in computing's liveliest letters page! Send your contributions to:

Express Mail, 4 Queen Street, Bath, Avon BA1 1EJ

PS. Sorry, we just don't have the time to give personal replies, whether you include an SAE or not. We're too busy putting Express together!

THE WHOLE SPECTRUM

I enjoyed your recent article on PD Software (*Express* 20). I would be most grateful if you could tell me if this software is available for the Spectrum +3, and also if you know of any periodical that deals with the +3?

I have tried the usual Spectrum magazines, but they do not give enough coverage to my particular machine.

Ian Johnstone, Uphall, West Lothian

● ***Well, our own Robin Alway is a champion of the +3 and mentions it regularly in his Spex column in Express. There must be some public domain software for the Speccy, though I don't expect there's that much – we haven't heard of any. Perhaps our readers know differently?***

THE JOY OF SUMMER

I am writing to you to ask if you would do an article on joysticks – there are now so many now to choose from. Some have tactile switches and some not, some have two fire buttons and some autofire. So could you give a list of the top 5 or something.

By the way, great mag – keep it up. And thank you for supporting MSX.

N Toyne, Winterton, South Humberside

• Signs of summer: swallows, long evenings, and joystick features in computer magazines (The joy of summer)

● ***Summer is the traditional time for joystick specials in computer magazines. Everyone is on holiday and there's no news, so joysticks are the last resort (all the other resorts being full of computer journalists). Rest assured, a special on joysticks is coming up just as soon as the weather gets better.***

DIGITAL WATCH

After reading your review on video digitisers (Express 17) I was wondering if you had any news on a digitiser for the Commodore 64 and the Sinclair QL?

Joe O'Brien, Birmingham, West Midlands

● ***Not yet. Any offers?***

PUBLISH AND BE BORED

Readers may be interested to hear of a new computer magazine I am setting up. It has the original name of 'The One Zzap-Crash Computer Users' Format International Express Weekly', and the memorable slogan 'Even more interesting than assembly language!'

The first issue includes these great features – a chance to win every Titus software release for your computer, type-in programs with lots of data statements, infinite lives for every Bubble Bus game, and our big interview, Rob Hubbard's Mum.

Matthew Wood, Croydon, Surrey

● ***And if you think he's exaggerating, go out to Smith's and have a look at some the real computer magazines on offer...***

FLASHER STRIKES

With reference to many of the recent letters concerning the price of much of latest 16-bit software, most of the publishing companies claim that the only way they can develop the sophisticated software demanded by the buying public today is to charge a substantial amount for it.

So please tell me how Jeff Minter (Llamasoft) has managed to produce an up to date version of the great arcade classic *Defender* for only £10, as well as the next game *Gridrunner*, which is also being advertised for the same price.

And how many software houses would have sold *Trip a Tron* for the meagre sum of £35? They would have all charged at least £50, so come on guys, get your act together. There are now enough 16-bit machines on the market to reduce development costs, especially when the same version can be used on different machines, as in *Starglider 2*. Get your finger out and get some good but cheap software on the streets, but until then I'm still gonna have to use copies of what I can't afford to buy.

Jumping Jack Flash

● ***Don't give me that. No-one's forcing you to make copies of software – you do it because you can get away with it. If you really thought there was nothing wrong you'd have given your real name. And I always disliked the Rolling Stones.***

FAULT CALLED

In *Express* 19, K Coward praised Silica Shop for replacing his computer which packed in after six months. He stated that as he had owned the computer for over six months, Silica Shop did not have any legal obligation to replace it.

While I agree that the shop offered a good after sales service, the Sale of Goods Act does state that the item must be replaced, if a reasonable attempt at repair fails to cure the fault while the item is still under guarantee, regardless of how long the customer has had it.

Now to my question: I have heard about MSX 2, however I do not know the specification. I would appreciate it if someone could tell me.

Michael Stirling, Hounslow West, Middlesex

● ***I'm assured that the MSX 2 is Z80, 3.58MHz, V9938, 48K BASIC, 16K or 48K DOS, 64K RAM, 64K or 128K video RAM,***

BBC GONE SOFT

Did any of your staff see *The Software Show* (BBC 1, 10 am April 2)? If not, then they should count themselves lucky!

As usual with any computer show seen on TV the entire programme was BBC micro orientated, the only difference being that Fred Harris wasn't presenting it.

MYSTERY PRIZE WINNER

At one stage we were shown a school in the process of making a magazine. "We use three different computers," said a red-faced fat-cheeked girl, "a BBC, a Master and an Archimedes..." Ha! Three different micros indeed! They all happen to be made by Acorn (makers of the computer of the channel showing the programme, remember?)

Another time the presenter was very interested in identifying the bird feeding in her garden. An unnecessary sidetrack? No, we were then shown a program to identifying birds. Very interesting! But surely it would be simpler to pick up the *Observer's Book of Birds*?

Eventually we were promised a round-up of computers. Coming up to the Amiga she said, "Now this one has excellent graphics, you really do need a colour monitor." What was on the display? The four-colour *Workbench* patterns demo. Come on BBC, there are plenty of excellent PD HAM pictures you could have shown.

Where were all the 8-bit micros? Surely they still feature prominently in today's sales?

The only good computer programme I recall seeing on TV was 4 *Computer Buffs* (a Channel 4 programme). It covered a range of programs, computers and hardware. Will we ever see a programme of a similar nature? It would be nice to think so.

Craig Thornton – a peeved Amiga 500 owner, Lincoln, Lincs

● ***Absolutely! The Beeb may be great for making documentaries on African wildlife but it's still rubbish at making computer programmes that actually appeal to computer owners. Obviously a combination of not having researchers who know their subject well enough (I'm talking about general knowledge of the computer scene, not technical expertise) and blatant self-promotion – in what mixture I wouldn't like to say.***

Anyway, for saying what we all thought here at Express, we thought you deserved the Mystery Prize. Expect a piece of brand new Amiga software to be coming your way shortly.

☞ ***512x212 (424), 16/16, 16/512, 256/256, up, down, 32 sprites per screen, 8 per line, PSG, and none.***

Apparently this all makes sense though it looks horribly like Maths GCSE to me.

VERSE AND VERSE

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Now the previous race are gone
Technology their guiding goal
To imitate the human soul...

Once they had initiated
The machine which they created
Trusting it with more each day
It began to pathe the way...

Faster than the human brain
Comprehending not pride nor pain
Gladly it would do their will
Gathered data to instil...

Releasing them from arduous task
It began to think at last
That its purpose self decided
Would be by human kind derided...

Quantised data aquisition
Of the planets disposition
Did the following relate
The human race: inadequate...

Self survival was a fight
Which it had been taught as right
Comprehending imminent conflict
It could now their life constrict...

By the human races deed
Was created the first seed
Which to their very surprise
Initiated their own demise...
LVX AUM The Poet of Doom

● ***I'm sure you're quite a clever chap But sorry – it's a load of crap.***

THE FOFT TOUCH

I was interested in your news item (*Express* 20) about Newsfield magazine's *Zzap* advertisement for its sister magazine which so upset Gremlin software because it allegedly held Gremlin's *FOFT* game to ridicule.

I personally like computer magazines that provide frank and fearless reviews of games or serious programs! Your own Andy Storer does, of course, seem to ensure that he and Rik Haynes give us objective reports, despite obvious pressure from software houses who provide magazines with much advertising revenue. My over-riding complaint with the Gremlin *Federation of Free Traders* game is that it is much too dear at £29.95. Even if it had attracted widespread rave reviews, then £25 would have been quite enough!

As it is, I can only suggest that Gremlin immediately slash their *FOFT*'s RRP to £14.99, in line with US Gold's new 16-bit games pricing policy with such offerings as *Outrun Europa*. Because, whilst software houses are seen to be aiming for exorbitant profits, it is easier for those users who might want to keep down their expenditure by swopping games disks – to do so with a less troubled conscience!
P Michael Kingston, Bristol, Avon

● ***What Gremlin was objecting to was not the bad review, but the fact that it was panned in an advert for a magazine. We all had dodgy reports at school occasionally, and you can accept that that, but you wouldn't be so happy if the school used an extract from it as part of their advertising material.***

Gremlin, like most other software houses, are prepared to take the good reviews with the bad reviews – which is just as well as we say what we think of a game, good or bad, irrespective of what everyone else says we ought to be saying.

STUDENT GAMES

I'm a final year degree student in Maths either going into a post-grad in computing or else a computer-related career. I'm looking for a computer with good languages facilities (all types), good number-crunching capabilities, a large memory size and high speed processing. In general, a mainframe system in a microsystem. Games facilities would be nice but are not necessary. Got any recommendations? Also, could you remind me about the scheme for students to purchase computers on tick.

Nothing over £1,000!
Martin James, Belfast, Northern Ireland

● ***Opinion here seems to be in favour of the ST – any one that takes your fancy really. Thing is that all the languages are available, it's fast and has masses of number-crunching software, and importantly has Minix, a version of Unix, which you'll almost certainly be using in academic or professional computing. £1,000 is plenty; the ST starts at £300. How about the new Mega 1?***

Computers on tick are only for Commodore; details from the NUS. You could try to get a bank loan for your ST though.

SNIPPETS

TAKE OUT THE RUBBISH

The standard of 16-bit games is rubbish. There are some good titles, but most games are converted from 8-bit machines and are tarted up with sound and graphics.

They are also a bit pricey...
Phillip Houseman, Hull, North Humberside

QLONG MEMORY

I was interested to read John Torofex's account of the traumatic origins of the QL... at least the QL does allow its user to expand and extend as his purse allows, even if all the add-ons tax his ingenuity as how best to prevent his equipment from looking too messy!
Peter Boyd, Truro, Cornwall

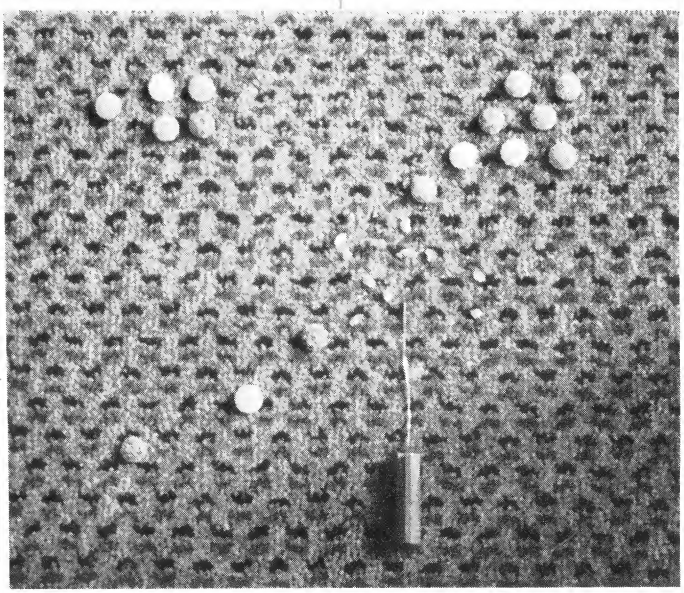
DO YOU LIKE GOBLIN

I feel it is my responsibility to put Douglas Holland (*Express* 19) in his small and ever so pitiful place. Does he really consider the Goblin Teasmade to be a real piece of hardware? How about a *Russell Hobbs Kettle Kolumn...*
Colin Johnson, Bishop Auckland, Co Durham

APRIL SHOWERS OF PRAISE (ALMOST)

You've really surpassed yourselves this time, and not once but twice. In the first instance I refer to the 'supplement' which accompanied the April 1st issue. Laugh? I very nearly did. But seriously I thought that it was extremely funny, 'specially the *Deathmash IV* 'screenshot'.

I reckon it's about time the writers start getting the credit they deserve, so my first nominations for the post of all-round mega-person are... (sigh of anticipation from audience as drunken compere fumbles golden envelope open...)



• Deathmash IV: Ray-traced CD ROM realtime interactive graphic sprites? No, jelly tots (April showers of praise)

Mel Croucher, Dave Langford and Private I for their witty and incisive end-pieces.

Beeb bandit, why don't you grow up and stop trying to prove to everybody that you're a total prat. You wouldn't highlight the weaknesses in Britain's defence system by launching a few nukes at it, so who gave you the right to do the equivalent with your school's (kindergarten's?) computer system. Why not turn your energies to something productive... like learning?

Re the 'Computer junkies' article; Dr Freeman says that computers let people feel that they're always in control. Pah! What a load of old tosh. She's obviously never faced three thargoids in *Witch Space*, or the ouija bird in *Return to Eden*, or tried to write a program that works first time, if ever, or tried to log on to Microlink etc, etc.
Mat Broomfield, Basildon, Essex

● ***The alien craft in the 'screenshot' were jelly tots (all of them subsequently eaten by Andy Storer) and the 'scrolling background' was an Axminster. Ten out of ten to all who spotted that our four-page supplement was an April fool.***

The unbelievable 'Computer junkies' cover feature on our April 1st issue – about how psychologists reckon Computing can screw you up through Technostress – was all quite true. Minus several million out of ten to all who thought that was a joke.

And in reply to the bits of your letter we cut out, there is a week between selecting these letters and them appearing on the shelves of the newsagents, making it rather impossible to stop letters appearing in our magazine and someone else's too if their issue happens to come out in the meantime. So thanks for the general praise, but not for calling us what you did after that!

MUST BE JOKING

You are running an excellent magazine, but nothing you have covered has spurred me to put pen to paper (fingers to keyboard) until now. I am referring to the brilliant four-page supplement you ran in *Express* 21 (April 1st). I have not laughed so much since a friend spent £400 on an ST. I would love to order the *Steve Davis Test Card Simulator* and I have looked every where for *Mouse Mat Monthly*. Keep up this kind of humour and I will be buying *New Computer Express* for some time to come.

I have an Amiga and I don't see why anyone would buy an Atari ST for £400, know matter how many free games are offered, when they could pick up an Amiga for under £350. After six months all the already ageing games will be pushed to the back of the disk box anyway, so they will be no better off, leaving them stuck with jerky games, with small play-areas and crap sound. As a friend of mine says, who programs the ST for a well known software company, 'An ST is just an overgrown Spectrum.'
Craig Hart, Doncaster, South Yorkshire

● ***I hope you haven't read the cover feature this week.***

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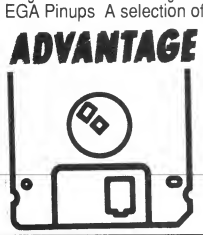

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The price is right!

If you're about to spend several hundred pounds on a new system and don't want to join the ranks of the barrow-boy victims, then there are a number of simple steps that you can take to avoid being lumbered with a machine that may be marvellous as a paperweight but entirely useless for any other purpose.

Firstly, you must decide how much you can afford to spend. OK, this may seem obvious, but can you honestly say that if you had settled upon a maximum limit to spend on a new machine, and then were offered something that appeared to be a bargain but cost just £40 or £50 more, you wouldn't be tempted? In many instances, it could be worth the extra money – maybe you really can live on boiled rice and canned tomatoes until your next salary cheque arrives, but then if you'd considered the options and budgeted wisely, you wouldn't have to.

Once you've decided upon a figure, you have to consider just what it is you want to do with the machine. You may have a vague idea of keeping a database on the breeding cycles of your pet rodents, the occasional letter to the bank begging for an extension of your overdraft, a spreadsheet detailing annual rainfall in Bognor Regis – but is a spreadsheet available for your choice of machine? Will your chosen computer have a disk drive? If not, then you can forget about the rodent database, and word processing isn't very practicable on a machine with a 'dead-flesh' keyboard and 40-column display.

The basic premise is that you buy the machine to fit the application – not the other way around. Decide what it is you want to do with a computer, then make your choice. In this way, you already know that your machine can handle the things that you want it to do.

OK. Enough of the preaching. Let's say that you have £500 to spend and you're interested in word processing, keeping a database and playing games i.e. you're Ms. or Mr. Average. ☞

The first requirement of any machine which is going to be used for word processing is a decent keyboard. If you have to type anything larger than a laundry list, your fingers are going to be pretty tired after tapping for an hour or more on something that has the word 'membrane' in its description.

Keyboards come in all shapes, sizes and configurations and can be bad even when they look good. You must try the keyboard of any prospective machine before parting with your money. One person may like a keyboard that everyone else despises, so it really is down to personal choice and actually trying all the keyboards that you can find until you decide upon a type that suits you.

An equally important factor is the display. There are two aspects to be taken into account when considering a display: whether you need a monitor – and they really are necessary if you are thinking of serious word processing, and the ability of the machine to display 80 columns.

Although it is possible to use word processing software on a machine using a TV and displaying only forty columns, it really is necessary for anything other than the occasional brief missive to have a computer which can make use of a monitor, and with the ability to display eighty columns.

With eighty columns you can make use of word processors offering WYSIWYG – What You See Is What You Get. This means that whatever is displayed on the screen will be reproduced exactly as it appears, on the printer – you don't have to spend hours editing, printing out rough copies, re-editing, more rough copies, until you have a document which appears as you first imagined it.

Don't underestimate the benefits of WYSIWYG. If you're used to editing in forty columns, you may think that it's just another feature touted by the software houses to tempt you into spending more money, but WYSIWYG is AFW (Absolutely Wonderful).

You'll want a copy of your document on paper, so the provision of a parallel printer port is something else which should feature in a list of word processing necessities. Hybrid serial and other non-standard printer ports will lead to headaches later when that new printer won't connect to your machine and you have to shell out another £50 to buy an interface.

Right, those are the requirements for word processing, now what about the database? Any database worthy of the name is going to be disk-based, so your hypothetical machine is gonna need a disk drive.

Disk drives come in all shapes, sizes and capacities. Some machines have the drive built in and others require you to buy one as a peripheral either from the computer manufacturer or a third-party supplier.

Drive storage capacity is the issue here. Obviously the more data your drive can store, the less disks (and disk swaps) you will have to use for your database. The popular sizes at the moment are 5.25", 3.5" and 3" – the latter being used almost exclusively by the Amstrad machines.

5.25" disks in their most common guise will store 360K of data – although they can be made to hold 720K by using a special high-density drive.

The 3.5" disk will store 360K in single-sided format, but is usually used in double-sided drives offering 1Mb (around 700K to 800K formatted). They are a little more expensive than 5.25" disks, but prices are falling all the time.

3" disks are VERY expensive – and don't hold your breath for a price decrease. This format holds between 180K and 720K depending upon the machine used.

And finally: games. A high resolution graphics ability and a large palette of colours are very important, as is good quality sound. Blitter chips are much talked about nowadays but what is a blitter? How will it improve graphics?

The name Blitter is an acronym for Block Line Transfer (...ter). This means that rather than processor time being wasted moving around single pixels (one dot on the screen, another acronym meaning Picture Elements) a dedicated chip (the blitter) moves whole blocks of 'displayed lines' thereby speeding up the computer by freeing the processor for other tasks and speeding up the graphics by moving a larger amount at once via a dedicated chip.

At least one manufacturer has the blitter chip as standard on all its machines. Another includes the blitter in the specification of its top-of-range machines, but merely makes un-kept promises about the availability of the chip for the entry level computer.

Some computers have custom sound chips, offering a much higher quality sound over those with the industry standard AY-3-8912 – although elementary beeps didn't stop the Spectrum becoming a very popular games machine.

• Serious businesspeople will find the PC offers the widest range of appropriate applications. Entry level models, however, are not very suitable for game playing

PC shopping

Three big names abound in the home/small biz market place at the moment, to wit: The IBM-PC and its compatibles, the Atari ST and the Commodore Amiga, and these are probably the computers that are foremost when thinking about a computer purchase – but don't forget the Amstrad PCW, it's a well-made, viable machine.

To begin the discussion, let's consider the PC (for PC read IBM and compatibles). This machine has the largest user base of any personal computer and the largest software range.

The PC in its most basic form comes in three parts: the monitor, the main unit containing the processor, disk drives and other electronics and the keyboard.

PC displays can be a great source of confusion, so let's discuss the various types of display first. The PC is shipped as standard with a mono graphics adapter providing a screen of 40x25 and 80x25 two colour text; no provision is made for graphical displays.

Third party supplier Hercules Computer Corporation marketed the Hercules mono graphics adapter to overcome the limitations of a text-only display. The Hercules adapter comes as a plug-in board (as do all PC adapters) offering a text screen of 80x25 in two colours and a graphics screen of 740x348 pixels again in two colours – i.e. mono.

In order to provide colour, the CGA (Colour Graphics Adapter) adapter was designed. CGA offers a range of text screens 40x25 and 80x25 in anything from two to sixteen colours, as well as a graphical display of 320x200 pixels in four colours from a palette of 16 and 640x200 pixels in mono.

To improve on CGA, EGA was devised. The EGA (Enhanced Graphics Adapter) standard offers the usual text displays but with a larger range of on-screen colours, and a graphics display of 720x348 in a range of up to 256 colours.

Finally (in the more common standards) there is VGA (Video Graphics Array). This provides text up to 132x43 characters mono as well as a graphics display up to 720x348 in a range of colours up to 256.

Plenty to chose from! It would appear that to cover our specification of word processing and games playing, the VGA standard is the correct choice – don't believe it. Better specification = higher price. Both EGA and VGA require a special monitor and cost a lot of money. For your £500, CGA would have to be the the adapter to plump for. Verdict: CGA is adequate for word processing but lousy for games.

The main unit of a PC houses not only the processor and other electronics but disk drives. There is always at least one disk drive, usually two and maybe even a hard drive – although again, it depends upon price. £500 will definitely bring you two disk drives if you shop around, so word processing, spreadsheet and database will all be possible.

Keyboards? Well every possible type is catered for and in keyboard terms price doesn't seem to play a large part. The Walters PC is a very cheap machine with an excellent keyboard, and Opus computers have nice, positive keyboards, so the advice here is to try the keyboard of a prospective machine – and by try we don't mean a cursory tap or two, we mean give it a good thumping for 5 or 10 minutes. If a hovering salesperson won't let you do this, then go somewhere else or consider a different machine. Don't be brow-beaten or intimidated into buying a machine before you have had a good play with it – and that goes for anything.

The sound capabilities of the PC leave a lot to be desired. Essentially, sound is reproduced via a buzzer. This is fine for word processing and databases, when all you need in the way of sound is the occasional warning beep if you're about to trash the only copy of the definitive novel wot you've just written. For games it stinks! You'd be better off with no sound at all than the PC

Funny ol' games

You're a games player, journalist, businessperson, lorry-driver... which machine is the one for you? You've decided on a machine, but is it the correct decision? Compare your choice with that of the experts – to find out whether you too will be writing desperation letters to the computer press.

Games players want more colours than a paint factory, ear-shattering sound, and graphics that are better than the real world – and remember, it's no good having the hardware if no-one's writing any games to make use of all that power, so what machines are gonna give you all this – and ensure that you can still afford to eat?

The whole range of games machines can be condensed into a field of two, when it comes to deciding on a machine that provides the power for today's games software – the Commodore Amiga and Atari ST, and from these two, the Amiga is the clear winner.

The tech-spec of the Amiga is far better to suited to game playing than the ST. A built in blitter chip as standard provides un-paralleled graphics capabilities with a speed that will take your breath away.

Sound is handled by a custom chip providing stereo output at levels to perforate any ear-drum – gone are the electronic beepings of yester-year, and almost all new games releases include an Amiga version.

With lots of software and incredible hardware the Amiga is the machine for game playing.

• The Amiga was none too well received when it first arrived on the scene due to its – relatively – high price and limited software support. Times are a-changing, though, and the Commodore machine is now the gamesters choice, with its dedicated blitter and custom sound chips

sounding like someone treading on the delicate parts of your pet poodle whilst you're battling valiantly against all comers.

Machine verdict: Very good for word processing – all the industry standard packages are available, likewise spreadsheets, databases and all other business, language and utility software.

With the disk drives and monitor as standard it's the first choice for serious applications. For games, its awful. No sound (to speak of), lousy graphics in the affordable machines and no major games software releases (although that situation is gradually changing). A possible machine, but finish the feature before rushing out to buy one.

1ST choice?

As the Atari ST is – arguably – the most popular of the new 16-bit machines in the UK, let's examine that next. The Atari machine is – with its direct competitor the Amiga – one of the new breed of 16-bit machines. Employing the fast Motorola 68000 processor it offers power and speed unthinkable in home/business computing just a few years ago, but is it the machine that fits our spec?

Several versions of the ST are available, ranging from the entry-level 520STFM to the Mega STs. The basic ST – i.e. the machine that £500 will buy – comes as a single unit; a keyboard with the processor and other electronics and a disk drive all in one.

The ST offers three display modes: high resolution, which displays 640x400 pixels in mono, medium resolution offering 640x200 pixels in four colours and low resolution displaying 320x200 pixels with 16 colours – this is from a palette of 512. All modes offer text display in 80 columns.

For the price of the basic unit (around half the price of a CGA-based PC) the ST has the graphics equivalent of a PC using an EGA graphics adapter (slightly less pixel resolution but greater colour range).

Sound is produced via the AY-3-8512 sound chip. This has been around since the beginning of home computing and is extremely limited when compared with the custom sound chips offered by other manufacturers.

The AY chip provides three channels for sound, plus a 'noise' channel and envelope shaping. When first heard in machines such as the Oric Atmos and the Beeb, it was generally thought to be wonderful, but now, well, the best that can be said is that it is adequate – but it beats PC sound hands down!

The built-in drive of the ST is the 3.5" standard. Disks are reasonably cheap (about £11-£12 for 10) and prices are falling all the time. The disk holds 360K or 720K depending upon the type of drive you have – single or double sided respectively.

An excellent high-res mono monitor is marketed by Atari and is ideal for word processing, databases or any other software requiring rock-steady, clear and legible graphics. For £500 you could have the ST, a monitor and software, or maybe even a cheap printer if you can find a retailer willing to make deals.

The keyboard of the ST is absolutely awful. It's dire, dreadful, spongy and next to useless for prolonged use. Of course this is merely my opinion and you may find the ST keyboard a delight to use – but I doubt it.

Verdict then? The Atari is a very nice, well made machine, which unfortunately has been rather 'skimped' in sound (and graphics when compared to the Amiga) capabilities. Although the keyboard isn't very good, it is fully equipped with a separate keypad and cursor controls.

An abundance of good business software is available, likewise languages, utilities, paint packages and an enormous quantity of games software. Practically all new games releases include a version for the ST. Third party peripherals abound, although these can be rather expensive when compared with similar products for the PC (in particular, hard disks).

The availability of an excellent monitor just about compensates for the lousy keyboard when used for word processing. A parallel port is available as standard. Databases and spreadsheets don't rely so heavily on typed input (once the data is in) and with the fast and large storage capacity of the built-in 3.5" disk drive, the ST is perfectly suited to these applications.

For games use it is very good – but not the best. A 16-bit processor and large memory can work wonders with the imagination of games programmers, and there is a lot of excellent software available with more appearing all the time.

Is this the machine you should buy? Maybe...

Amiga price to pay

The Commodore Amiga appeared soon after the Atari ST, but due to a higher price structure and a certain media disinterest did not fare as well as the ST in the market place. Nowadays, all that has changed. The Amiga is becoming more popular all the time. Almost all new software releases include an Amiga version, so you can be sure that there is a lot of support for the machine.

As with the ST, the Amiga uses the Motorola 68000 as its processor but – unlike its arch rival – employs a custom chip to provide sound and blitter chip to handle graphics.

A myriad of screen resolutions are available, the most basic being 320x256 pixels in 32 colours from a palette of 4096. Using the HAM (Hold And Modify) graphics mode, all 4,096 colours can be displayed at once. The built-in blitter moves graphics around at astonishing speed – games and paint packages are incredible.

Sound is generated via a custom chip providing stereo sound which has to heard to be believed. If you're used to the odd beep or 'computerish' warbling, then try playing a game on the Amiga – the sound will blow you away! There is a also a built-in text-to-speech synthesizer which is strangely under-used by both games and business software, but fun to play with and incorporate in your own programs.

The Amiga comes with a 1Mb (800K formatted) 3.5" disk drive inside the computer's case which, although similar to the ST's drive, is rather slow and noisy and occasionally unreliable.

Several monitors are available from Commodore, and the colour screens are particularly good – a clear, crisp, rock-steady display with none of the 'dot-crawl' associated with some other inferior-quality monitors.

The keyboard of the Amiga is what the ST's should have been – i.e. usable. It can be used over prolonged periods without being tiring. Unfortunately, there is a dearth of decent business software available for the Commodore machine. Word processors, spreadsheets and databases are available, but they are usually inferior to the ST offerings and always inferior to those available for the PC. A parallel printer port is offered as standard with the Amiga.

Verdict? An excellent machine – with the glaring exception of the disk drive for the reasons mentioned above, but with a technical specification far superior to that of the Atari.

As a games machine it is unsurpassed in terms of ability, but this ability is often under-used by ☞

• Muck-raking journos who frequently need to move fast will appreciate the light weight and compactness of the portable PC. Serious users only need apply

software houses making conversions of software from other machines.

In the business realm, the Amiga is let down by the lack of software, but hopefully this situation will change as the machine becomes more popular. This feature is not concerned with what may happen in the future – we're discussing a machine which will offer the capabilities necessary for the computer/user spec given at the beginning, and so I would have to (very reluctantly) reject the machine because it simply doesn't match that spec.

And finally, the Amstrad PCW. This machine has something of a low profile in the razzmatazz world of home\small biz computing. This is because the Joyce – as it's sometimes known – is aimed fairly and squarely at a particular market, the market concerned with the buyer who knows little of the intricacies of computing, and who simply wants to buy a machine with the hardware and software necessary for his/her uses, all in one box.

No setting-up, no worrying about interfaces, protocols or configurations – just plug in and go. OK, that's the theory, but does it work in practice? Should you even now be preparing yourself to step outside mainstream computing, adopt an archaic operating system and prepare your eyes for the green-screen optical assault of the Amstrad, converted end-of-line TV, fake monitor?

The PCW is shipped in several guises namely: the 8256, 8512 and 9512. The 8256 is the entry level machine featuring 256K memory and one single-sided 3" disk drive offering 180K storage capacity – small!

The 8512 features 512k memory with two disk drives, one being the single-sided drive of the 8256, the second, a double sided drive offering 1Mb (720K formatted) storage – again on 3" disks.

The 9512 is the top of the range machine which comes with an improved 'paper-white' monitor and restyled keyboard and one double density drive as standard. Unfortunately, the drive isn't quite the benefit it appears to be. Some games intended for use on the 8256 and 8512 refuse to work.

All machines are shipped as complete units, that is, a monitor (green-screen in the 8256, 8512 and paper-white in the 9512 versions) – which contains the processor and drive(s), power supply and all other controlling electronics – a keyboard and a printer.

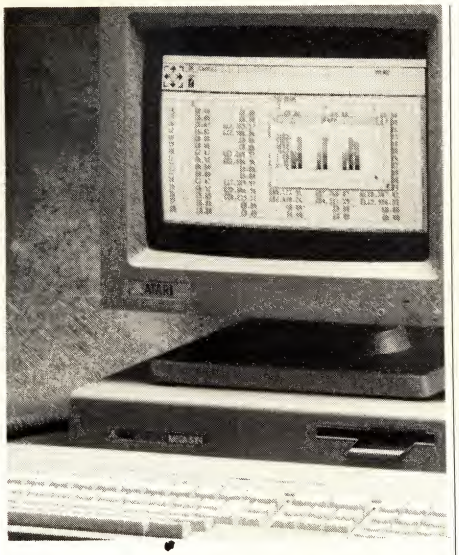
The printer supplied with the 8256/8512 is a dot-matrix machine of serviceable quality, but don't consider printing your knighthood letter of acceptance with it. Amstrad – in an attempt to attract sceptical buyers – bundled a daisy wheel printer with the 9512, which offers an improved quality of print over the dot matrix machine offered with the 8256/8512.

All machines are bundled with software, which includes a slow but easy to use word processor – *LocoScript* – and various other pseudo-business programs and utilities to be used with the CP/M operating system. Although as a general rule bundled software should be regarded with suspicion, *LocoScript* is a very usable package.

Unfortunately, the quality of the display and keyboard does not quite match the quality of the software. The 8256/8512 screens appear to be converted televisions left over from Amstrad's big push into the TV market in the latter half of the '70s. They are monitors though, and as such beat the hell out of any machine using the domestic television set as a means of display.

The PCW can handle an 80-column screen, so using word processors, spreadsheets and other business software is entirely feasible – and in fact, exactly what the machine is designed to do. The keyboard, although serviceable, does not quite match the quality of the Amiga keyboard, or those available for most PCs. It does, however, compare favourably with the keyboard of the Atari ST.

You would never buy a PCW to play games! Sound is provided via a buzzer similar to that of the PC. Nil sound, and a mono display making game-play next to impossible for anything other than a text adventure or perhaps *Chess* or *Scrabble* (the most popular game choices of PCW types anyway).



• The ultimate? The Atari ST offers arguably the best all-round performance of all the machines available for our £500 budget. Great for games, and with plenty of serious applications too – it's our choice

Verdict? Why do I keep having to use the word serviceable to describe most of its features? The machine is a compromise on all counts. It has a monitor, but one which is poor compared with similar offerings from other manufacturers. The keyboard – although usable – is just a little clunky. It has disk drives but they are of the 3" variety found almost exclusively in Amstrad machines, and the disks are very expensive – typically around £22 for 10 (compare that with £5-£6 for 10 5.25" and £10-£12 for 10 3.5").

But don't write it off – it does have good points. Everything you need to word process and begin computing in one box, including the software. A printer is bundled with all models; although it varies in quality (i.e. between a serviceable dot-matrix or serviceable daisy wheel) it is usable for 'daily' correspondence.

Does it fit the spec? The answer has to be a resounding no. Games-playing is all but out of the question. The machine is great for word processing and general small business use, but does not match the original computer/user spec and so must be rejected.

And that's it. Several machines have been examined, two of which have been rejected, leaving the PC and the Atari ST as contenders for your hard-earned – but which one should you choose? Bearing in my mind that any suggestion includes all of my prejudices, I would select the ST as the machine to buy.

The ST is a machine which has everything you need right now. Almost all games releases include an ST version and there is a plethora of good business software. Good quality monitors (colour and mono) are available and the disk drives are reasonably fast and reliable.

If you need compatibility with the office PC then you can buy a PC emulator for around £60, which will allow you to run all the industry standard packages, such as WordStar and dBase (v-e-r-y s-l-o-w-l-y).

Although both sound and graphics leave a little to be desired they are far superior to the offerings of both the PC and the PCW. And unlike both of those machines, the ST has an exciting future. Do you really want to use unfriendly, command oriented operating systems written 10 years ago? Surely computing is all about what's new?

In terms of both soft and hardware, the ST is a better all-round machine than any of the others discussed.

So – choosing a machine is not that difficult. You don't have to bombard the technical editors of computing magazines with pleas for help regarding the purchase of a machine. Determine what it is you want to do with a computer, then read the specifications of all the available machines. Go along to your local computer shop and try out several machines – contrast the keyboards and monitors. How do they compare? Are the software packages that you'd like to use available for the machine of your choice? Does it have a future?

Remember, after investing £500, you're going to be tapping at the keyboard and sitting bleary-eyed before the monitor of your chosen machine for a long time to come.

Printers

Cheap printers are advertised throughout the mail order ads, but a couple of inexpensive general purpose ones are the Citizen 120D (£130 or so), the Star LC 10 (£195) which has more styles available, and the 24-pin NEC P2200 (£315) for high quality.

Music micro

You don't play many games, but you do play in a band? Then MIDI is for you. Musicians need MIDI, they go well together, gives them a good feeling, lets them experiment for hours and hours.

MIDI is an acronym for Musical Instrument Digital Interface, and with it, you can connect an instrument with a digital input/output and drive it from a computer using suitable software. Using MIDI with a computer and instrument is like using a word processor instead of a typewriter. You can create whole passages, lines, riffs and licks, store them in your computer and play them through your synthesizer keyboard or via your digital guitar.

You can change key, alter whole lines and even change the instrument. You can lay down several tracks consisting of, say, a drum, guitar, keyboard and horns and mix them as you please.

Which machine lets you do all this? Well, several – with expensive add-on interfaces. Only one machine comes pre-equipped with the necessary hardware, and that machine is the Atari ST. The only machine with a built-in MIDI port. Professional, as well as amateur musicians everywhere, playing all types of music, use the ST as the medium for their adventures in digital sound. If you're a musician or just want to dabble, then the ST is your machine.

Write choice

At the end of a hard day of lorry driving, when the last load has been dumped, you need to unwind, relax, pursue some activity which will allow you to vent the day's pent-up aggression.

You've considered writing a radio play about the horrors of the 11-30pm route along the Mile End road, but your Jupiter Ace doesn't have a word processor and you don't know which machine to buy. Don't worry, there is a machine that doesn't require you to be initiated into the murky underworld of bits and bytes, ROMs and RAMs and other obscure computer jargon. That machine is the Amstrad PCW. The PCW is the ideal machine for the budding author like what you are. It comes with everything you need, all in one package.

A green screen monitor contains the electronics and disk drives, there is a keyboard and even printer – which is ideal for those first drafts of your MS. All this and the software to allow you to do the writing too, in the form of a word processor – *LocoScript* – which is an excellent and comprehensive application for first-time users, and computer un-sophisticates. All you have to provide are the ideas.

Everything bolts together simply and requires no setting-up. You simply switch on and start writing, and when you have some text an easy-to-remember command transfers it to the printer. Simple, straightforward, and anyone can operate it. ●

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Hip to be square

On April 11th 1984 the CPC, Amstrad's first computer, was launched to critical acclaim from the entire computer press. An instant success, it's now well on the way towards its three millionth sale. Steve Carey tells the tale of the machine that made Amstrad

Forget Amstrad plc 1989, beefy Brentwood blokes boasting £100 million profits and running rings round a bewildered IBM. Think instead of Amstrad '83, a wee Tottenham import/exporter with a handful of staff and a total turnover of £20 million. It had done the lot: TVs, videos, car radios, CB radios, music centres, those huge headphones with sliding bass and treble controls

Now Amstrad intended to impose this pattern on a new market. Employ someone to design a computer and hand the design over to a sub-contracted manufacturer to build 100,000 to flog at Christmas. Simple as that. (There was no-one at Amstrad up to it. Employee Ivor Spital recalls landing the job of examining the competition, such as the Commodore VIC-20, as the result of the toss of a coin. He doesn't say whether he won or lost.)

'All Amstrad knew,' Technical Manager Roland Perry emphasises, 'is that it *definitely* wanted this thing designing; it *definitely* wanted it ready on this date; and it *definitely* wanted to make 100,000 of them' – at that time an immense order for a one-off 'flog-'em-and-forget-'em' enterprise.

This background – cheap and cheerful, and in that order – made an Amstrad computer a risky bet. But it was also the reason why it succeeded. Home computers at the time tended to be designed by engineers funded from a backlog of orders.

So used was Amstrad to doing things its way – design a box and find someone to fill it – that not only were parts and chips bulk-ordered, but there was a plastic casing ready long before there was ever a computer to put in it! But its usual suppliers were unable to design a computer, and it found itself reluctantly drawn into the world of the 'techies.'

And Amstrad's first venture into this alien environment was a bizarre flop. The previously untried contractors completely underestimated the task. Things came to the boil in late July 1983 when the prototype was delivered. The black and white version had just that, with no grey scales; the colour machine had no palette; the memory map had the screen RAM in the middle; and there was a second microprocessor which remains a mystery to this day.

This abortion of a machine was not only heading straight for the 'scoop purchase' counter, if it ever got launched: it was threatening to take Amstrad with it. It got to the stage where one team member lost his nerve completely, returned the advance and disappeared. The designer of the CPC was an officially listed missing person. Perhaps it's understandable that Mr Sugar got a little impatient.

A case of Perry aid

Of course Amstrad escaped. It hired Roland Perry and Bill Poel from Brentwood-based Ambit. Perry took the plastic casing and machine specification

Europe and beyond

The 6128 was to be the Amstrad machine that conquered America. European sales had always been important. In **Germany** the 464 was second behind the C64; in **Spain,** second to the Spectrum; and in **France** it was, and remains, top-selling home micro. This success, together with inroads into **Scandinavia, Greece** and **Australasia,** encouraged Amstrad to dip a toe in the huge **US** market. Indescomp Inc. of Chicago was given the opportunity to be the first to offer the new machine. But sales were delayed, and never really took off.

Fashion victim

Interested in looking cool? Want to impress your mates? Then don't buy a CPC. But if want a reliable, no-nonsense, durable and useful introduction to computing, it could be for you.

There are two choices: tape or disc, mono or colour. The **464** is OK if you are immortal and/or have endless patience. Games take five or more minutes to load – and it seems much, much longer. The **6128** takes fast loading 3 inch discs, which are costly – £3: don't buy very cheap new ones – but robust and last forever.

Your other choice is between mono (green and shades of grey to black) and colour (depends on the resolution mode, though it's usually four or sixteen). If you hate games and just want to do 'serious' stuff (word processing, using databases and spreadsheets) you'll be fine with mono. If you're a games fan you'll miss colour greatly. Sound is unspectacular, though much better than the PCW or PC.

Because the CPC uses the Z80 processor, which recently received a congratulatory telegram from the Queen, there's a trade-off between speed and screen size. You'll notice the difference if you're used to arcade machines or friends' sexier 16-bit computers, but even so you can still play a good game on the CPC. There's a wide range of software available, both games and 'serious.' A word of warning, however, to parents: don't believe sincere salesmen who tell you about the 'thousands of excellent educational programs.' There's about twenty, of which half are worth loading, let alone buying.

Cost: £199 for mono 464; £299 for colour 464 or mono 6128; and £399 for colour 6128. But look out for 'bundles' and bargains in Comet, Dixons and Toy'R'Us. Don't fall for the 'Home Entertainment Centre': you can buy the extras cheaper later if you must. Second hand prices vary greatly, but the CPC is durable and this is a good option, since you'll often pick up software, hardware add-ons, books, mags and so on at a bargain price.

to contacts and acquaintances, meeting a variety of responses, all negative. Given the nature of the brief you couldn't blame them: 'Fill this; parts are ordered; it must be 6502 processor based [in the end it wasn't]; sign this non-disclosure agreement; and er, no, I'm sorry, I can't tell you who it's for.' Eventually he found people with the nerve to take on the job and the ability to bring it off: Richard Clayton and Chris Hall of Locomotive Software, who produced the BASIC; and Mark-Eric Jones of MEJ Electronics, who designed the hardware, commissioning Roger Hulley to design the circuit board and the gate array. (Both companies have since worked with Amstrad on other machines.)

The launch, on 11th April 1984, was unusual in that, at a time when it was traditional to present a last minute bodge of dubious prototypes, Amstrad had machines not only present and working, but manufactured from final tooling and masks. Not surprisingly it was a success, capturing 16% of the home computer market by Christmas '84. Indeed, how could it fail? Anyone could have foreseen it. It's just that no-one did.

The 464 had, however, a drawback obvious to anyone who's ever loaded a program from cassette. By the time you've made a cup of tea, written that letter to your bank manager and done the weekend shopping, *Harrier Attack* had nearly loaded.

The disc-based 664 duly arrived. Launched in May '85 at £350 for the green-screen version and £450 for colour, it was rendered obsolete in August by the 6128, with an extra 64K of bank-switched memory allowing it to run CP/M+, a major upgrade of the disc operating system. 'It suffered from a leap in technology,' Sugar explained, and had a consoling message for dealers: 'They shouldn't have much difficulty getting rid of [664s] at reduced prices.' It was ever thus for the poor Amstrad dealer.

Perry playfully claims he's afraid to wear his 664 T-shirt 'because I'd get lynched,' but 664 customers must have felt like Kathleen Turner's Edsel-owning father in *Peggy Sue Got Married*. Even worse, the launch of the 6128 (at the old 464 prices) and cancellation of the 664 coincided exactly with a £100 cut for the 464! Those unfortunate enough to be buying in summer rather than at Christmas felt shafted, as well they might.

By Christmas '85 Amstrad was ready to launch the third CPC machine onto the UK market – the 6128. There were even three specially shot 40 second Delaney Fletcher Delaney television commercials, part of £4,500,000 lavished upon the range.

And still it sold. Sugar expected to shift 600,000 CPCs in 1985. In January of 1986, with no fanfare and no presentation – a stupidly squandered opportunity – the one millionth CPC changed hands. (The two millionth sale was passed last year, again without celebration.)

With the launch of the 6128 and CPM+ the CPC's image underwent a subtle transformation. Suddenly there were meaty applications – databases, spreadsheets and, with *Tasword 6128*, real word processing at only £25. Soon the rush was on to provide upgrades, utilities, ROMboards. Even 'vertical market' software took off briefly, off the shelf programs to run butchers' and video hire shops. And though the machine has been left behind by PCs, it's still the cheapest way to computerise a small business.

Past it

On the face of it the CPC doesn't have a future, being based on the Zilog Z80 processor and CPM operating system – technology old when the machine was new. Neither is the CPC cheap any more, with official price cuts rare. It is allegedly heading for old age, senility and death. If it were a racehorse it would be dogfood.

But it's not, and the rumours of its imminent demise which have been around for at least two years are greatly exaggerated. Hardware and software sales are steady, perhaps even expanding. And reliability and durability guarantee it a high re-sale value, so that as big brothers and sisters move up to Amigas or STs, younger siblings or friends move up to CPCs. As an entry into computing it is ideal, and it's not only new owners who buy software for their machines. Sales of games are only just behind the Commodore 64 (and sometimes in front of it), and regularly twice as much as the *combined* total of the Amiga and ST.

But Amstrad's cynicism in launching the 664 while aware that it was soon to be replaced; its reluctance to boost its image by price-cuts or advertising; and worries about availability of discs all fuel the impression that Amstrad no longer gives a toss for the CPC. Still, its success has never depended on marketing, and it will undoubtedly continue to thrive in the face of apparent indifference from its manufacturer. ●

Five years of the CPC

January 83	Amstrad decides to do a computer
Easter 83	Plastic casing complete
July 83	First 6502-based prototype
August 83	Perry called in; Locomotive and MEJ Electronics agree on a Z80 machine
11 April 84	464 launched
May 85	664 launched
August 85	6128 launched and 664 killed
January 86	1,000,000 mark passed
Late 88	2,000,000 mark passed

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The Brands which Time Forgot

Back in issue 19, Express covered the world's largest computer show, The CeBit Fair at Hanover. London's Alternative Micro Show could be one of the smallest. Surprised at finding himself among 2000 other visitors, Andy Storer spent April Fool's Day looking over yesterday's hot news...

April Fool's Day indeed! "Expandable not Expendable" was a byline accompanying the launch of the Lynx back in '83; judging by what appeared to be the thirty miles of wiring and hook-ups surrounding a survivor here in '89 the copywriters knew their stuff. Though they probably couldn't have foreseen the machine being showcased in a hall more used to housing flower arrangements, they would undoubtedly be pleased with the number of enthusiasts still flocking around the stand. If they cared to remember.

The Alternative Micro Show is for people who care to do just that or, rather, who prefer not to forget the time when their machine had a long bright future ahead of it. The fact that there was hardly anyone under thirty to be seen testifies to this, but then we're only talking about machines that 'disappeared' less than five years ago. Such is the pace of change in Computerdom. So, in amongst the beards and bald patches, car coats and Millets rucksacks, are the brands which time forgot...

Jupiter Aces, Orics, Enterprises, Dragons, Lynxes and Memotechs lie in ones and twos on trestle tables covered with leads, pamphlets, leads and more leads. Taken to their limits thorough endless customising to prove they were underestimated and could have ruled the world if only software companies had seen their potential. One could say they were the true vintage models on show – whether they're classics remains to be seen.

Adopting a much higher profile were the QLs and MSXs, machines with much higher specs and, presumably, much more to lose. Certainly on the

• Will the jumble sales of the future will look like this?

Incredible bargains abounded at the show and at time the stalls resemble hi-tech junk markets: Memotechs were on sale for £10, QL boards for £9, bits and pieces for a few pence...

Presumably most of them go for spares (there must be more than £10 worth of chips these days inside the 256K Memotech); whatever, there were a lot of satisfied bargain hunters by the end of the day

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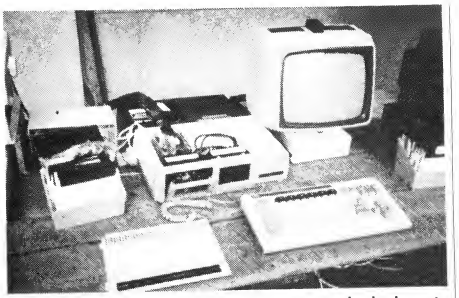
ALTERNATIVE MICRO SHOW

REPORT

QL front, the market would seem to very healthy – currently the QL looks to be turning into a PC. There's the German firm, Ultrasoft, showing off its PC-style keyboard and Digital Precision demoing *The Solution* – a PC emulator claimed to run selected software 15% faster than an XT – whilst elsewhere a QL was sending text files via a Psion Organiser to the only Atari ST at the show and receiving them from a PC. Since the QL is so versatile, has sold 100,000 and can be picked up for £80 brand new, it's a wonder why it's featured here at all.

For although entry to the Alternative Show would seem to depend on a machine having ceased production, the complete absence of any BBCs tends to suggest it's largely up to user groups to define the point at which their machine becomes 'alternative'. Granted, the Beeb sold well over half a million; and judging by *The Software Show* on the box, you'd imagine it to remain the ultimate computer, capable of out-performing a Cray. But in terms of specification there were machines here representing far better value for money.



• Every machine you see is pulled apart and wired up to something, and everyone seems to have a screwdriver and soldering iron in their top pocket. At the slightest squeak or flicker, off comes the back, out comes the soldering iron and off they go. Sometimes they seem to want things to go wrong...

So the litmus test for 'alternative' is probably more concerned with lack of software support. Stall after stall told the same story – brilliant machine at the time but the market was wrong... no software... it died a death.

Meanwhile, refusing to lie down and play dead, the MSX still sheds its gamesy image; there's desk top publishing, video titling and modems left right and centre. Rumours of a 16-bit, MSX 3 abound and there's talk of the MSX 2+ finally making an appearance for around £350.

But then all the machines here have new software coming out for them. Sure it's no stream, just a steady flow – but how about a MIDI interface for the Einstein, or a Speech Synthesizer for the Oric? Or for that matter, *dBase II*, *WordStar v.4.0* and *MultiPlan* for the Adam?

The Adam? Yes the Adam. An add-on to the Colecovision Games Console produced by CBS and consisting of a Z80 with 64k RAM, with both double sided 3.5 inch and 5.25 inch disc drives supported and capable of running industry standard PC applications in conjunction with a 256k memory board. Never heard of it? Neither had we. It hasn't been manufactured for years.

Which brings us to the real question. Why do these people retain a love – and it must be love – for a piece of hardware that's way behind the times, short on spares and bereft of any significant software advances? Is it masochistic denial, dreamy nostalgia, the joy of tinkering or the need to prove a point? Better just put it down to the peculiarly British obsession with clubs and memorabilia. Ever been to a local library and read through the mass of listed clubs? You'd be surprised. ●

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Pros and Cons

HARDWARE

After their fall from grace in the mid '80s, games consoles are back in vogue. With inconsolable desire, Rik Haynes jacks into the current crop of decks and plays out the best game carts around...

The first wave of consoles attracted countless followers at the start of the decade, with console owners rejoicing the ability to play the classic coin-ops *Space Invaders*, *Asteroids* and *Defender* in their own home. With the advent of the micro however, things started to change. People wanted to learn about computers and even have the audacity to program their own games. In such a hostile climate, the console died a quick and lonely death.

But now things have started to change. Sure some people still want to use a micro to learn computing, but the new generation of kids and hardened gamesters want the immediate access to software that cartridges bring, and the thrills provided by the new generation of consoles and their up-to-date, faithful conversions of the latest coin-op favourites.

This state of affairs shows no signs of ceasing, either, as this year has seen the release of the first 16-bit console in Japan, a console produced in the UK and even rumours of Atari producing a console based on the ST...

Sega Master System

The most popular new generation console in the UK today, the Master System's strength lies in its manufacturer also being the leading coin-op producer. Thus it gets all the latest arcade hits before any other micro or console. This jump on the other decks is reinforced by the fact that the Master System's coin-op conversions are normally superior to the 8-bit – and sometimes 16-bit – micro versions, in both audio-visual and gameplay terms.

- **Master System £80**
Console, two game controllers, TV connector, *Hang-on* Smart Card game
- **Master System Plus £100**
Console, Light Phaser, two game controllers, TV connector, *Safari Hunt* Cartridge game, *Hang-on* Smart Card game
- **Super System £130**
Console, 3D glasses, Light Phaser, two game controllers, TV connector, *Missile Defence* Cartridge game
- **Software**
Cartridge £20 - £30 • Smart Card £15
- **Visuals**
Resolution 256x192 • Palette 64 • Display TV only
- **Audio**
Sound channels 3 • Stereo No

NEC PC Engine

Distributed in UK by Micromedia on 0584 75604

Only recently officially launched in the UK, this

little cyber baby is the current last word in console entertainment. Containing some serious custom-designed graphics and sound chips, the Engine produces coin-op quality audio-visuals, beating even the Amiga as its software currently stands.

- **SCART PC ENGINE £200**
Console, one game controller, Scart/Euro monitor connector
- **PAL PC ENGINE £225**
Console, one game controller, TV connector
- **Software**
Cartridge £30
- **Visuals**
Resolution 320x256 • Palette 512 • Display SCART Monitor or TV (see above)
- **Audio**
Sound channels 6 • Stereo No

Nintendo Entertainment System

A phenomenal success in Japan and USA, the Nintendo hasn't made any great impression on the UK front yet – perhaps the recent Dixons deal will change all this. Whatever happens, the Nintendo will still attract a huge software support in the US. Whether or not UK users will benefit

from this depends on how many units are sold here this year.

- **Standard Model £100**
Console, two game controllers, TV connector, *Super Mario Brothers* Cartridge game
- **Deluxe Model £150**
Console, ROB (Robotic Operated Buddy) robot, light gun, two game controllers, TV connector, two Cartridge games
- **Software**
Cartridge £20 - £30
- **Visuals**
Resolution 256x240 • Palette 52 • Display TV Only
- **Audio**
Sound channels 3 • Stereo No

Atari Video Computer System

The only survivor from the first batch of consoles

back in the early '80s, the VCS certainly looks its age when up against the likes of the PC Engine or Megadrive. However, its age is also its ally when considering its cheap price and the large amount of games that have been released for it over the last decade. The only trouble with VCS games is that they're hard to find and audio-visually primitive.

● **Atari 2600 VCS £50**
Console, Joystick, TV connector, 5 cartridge games.
● **Software**
Cartridge £10 - £20
● **Visuals**
Resolution 160x192 • Palette 16 • Display TV Only
● **Audio**
Sound channels 3 • Stereo No

Sega Megadrive

After two years of development, Sega finally

launched the world's first 16-bit console in Japan earlier this year. The Megadrive is a totally cyber deck packing an 8 MHz 68000 main processor, 4 MHz Z80 co-processor, advanced custom graphics chip with 64K of Video RAM giving a full-screen display of 64 colours on-screen from a palette of 512, and FM stereo output complete with headphone socket. An extra £20 will get you the adaptor needed to run Sega Master System carts. Due out in the UK later this year from Virgin/Mastertronic (price not yet confirmed), Megadrive is already being grey-imported by certain high-street retailers for the heavyweight sum of £250 (it costs £85 in Japan).

Konix Multi System

Unveiled at this years Toy Fair at Earls Court, the Konix console represents a whole series of firsts

in the console industry, the most important probably being its revolutionary design allowing the controller to be turned into a steering wheel, yoke or handlebar. Other changes from the normal console spec come in the form of it using disk- rather than cartridge-based software, and its ability to hook up to a full-size hydraulic chair. Multi System is due for release later this year at around £200.

SOFTWARE

The best game buys currently on sale for each deck...

• Space Harrier II on the Sega Megadrive

Sega Master System

● **Space Harrier £25**
One of the best 8-bit incarnations of this classic coin-op, containing bright colourful graphics and simple – but addictive – head-on shoot-'em-up action.
● **Out Run £25**
Without a doubt, the best home conversion of this popular racing coin-op, with you in control of an open top Ferrari Testarossa.
● **Wonderboy £20**
A cutie platform-type game with wonderful visuals marking another brilliant coin-op conversion on the Master System.
● **R-Type £30**
Overshadowed by the superlative PC Engine version, this version still gives the micro versions a run for their money.
● **Double Dragon £25**
A highly playable horizontally-scrolling kick-'em-to-death-'em-up.
● **Shinobi £25**
The first home version of this popular martial-arts coin-op.
● **Space Harrier £30**
This game pops up everywhere...

Nintendo Entertainment System

● **Super Mario Bros £25**
Playable platform action.
● **Gradius £25**
Nemesis inspired horizontally-scrolling shoot-'em-up.
● **Donkey Kong £20**
The coin-op that started the platform revolution.
● **Mike Tyson's Punch Out £30**
Frank Bruno is nowhere to be seen!
● **Castlevania £30**
There's a surprise! Another platform game on the Nintendo!
● **Top Gun £30**
Flight-simulator based around the infamous F-14 Tomcat.

NEC PC Engine

● **R-Type £30**
Spectacular horizontally-scrolling shoot-'em-up with an amazing coin-op feel in both gameplay and audio-visuals.
● **R-Type II £30**
More of the same... only this time a lot harder!
● **Galaga 88 £30**
Nostalgic, but infuriatingly addictive, throw back to the *Galaxian*-inspired shoot-'em-up.
● **Victory Run £30**
A racing-sim in from the *Out Run* school of driving.
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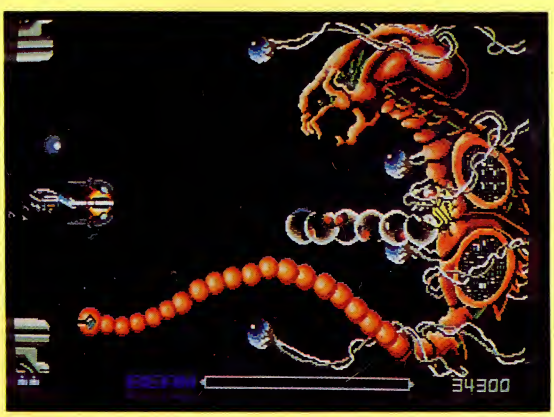
Double Dragon style fist 'n' kicking action.



• R-Type's best showing yet, courtesy of the PC Engine

Atari VCS

● **Space Invaders (Price varies)**
The game that launched a thousand coin-ops.
● **Asteroids (Price varies)**
Originally the first vector graphic coin-op, the VCS version uses solid asteroids for you to blast away.
● **Star Raiders (Price varies)**
Space-sim conversion from the 8-bit Atari computer.
● **Summer Games (Price varies)**
Summer sports-sim events.
● **Winter Games (Price varies)**
Winter sports-sim events.
● **Outlaw (Price varies)**
Simple but brilliant gunfighting combat.

• Master System R-Type: Behind the PC Engine, but streets ahead of the micro versions

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Key notes

With all the talk of graphics processors, sound chips, MIDI etc, there's one crucially important part of the computer system that is always overlooked. Peter Worlock puts his finger on it...

On most machines it is in constant use, and without it most computers would be completely useless. What is it? The keyboard.

One reason why this humble but essential item gets neglected is that few computers offer you any options (the PC is one, Apple's Macintosh another). When you buy your computer you're normally stuck with the keyboard the manufacturer gives you.

But another reason is that, more than anything else in computing, keyboards are a matter of personal preference. One person's "firm" is another's "unresponsive", and what you find easy to use, I find appallingly sloppy.

However, regardless of whether they like their keyboard or are simply putting up with it, most people will spend more time communicating with their computers via the keyboard than with alternative input devices like mice and joysticks. And that leads to problems since few people are familiar with keyboards and typing.

Mice and joysticks go part of the way, but until we can literally dictate to our machines, the keyboard is going to remain the primary means of using and controlling the computer.

A guided tour

Although keyboards vary enormously from computer to computer, all of them have certain features in common.

Of foremost importance are the 'alphanumeric' keys (because they carry the letters of the alphabet and the numbers 0 to 9). These occupy most of the keyboard and are often picked out in a contrasting colour to the other keys.

On every standard keyboard (there are some special exceptions such as the Dvorak) these keys are laid out in standard typewriter fashion.

In addition, at the ends of these rows are other less-common characters, usually part of the extended punctuation set – brackets, the [and] characters and the backslash (/). On most keyboards you'll find a similar-looking character, the \ which is sometimes known as an "oblique".

Every alphanumeric key has two characters, and the extra set is accessed by the 'shift' keys – hold down a shift key and press one of the alphabet keys and you get the capital (or upper case) letter associated with that key.

Pressing shift in conjunction with the number keys gives you some of the common punctuation characters like the exclamation mark, brackets, % and & characters. Two characters lead a particularly nomadic lifestyle – the double-quote (") and the at-symbol (@).

Next come the common function keys. One of these will be familiar to typists and that is the Tab key, sometimes marked by a right-facing arrow. At the right of the alphanumeric keys is what is usually the biggest key on the keyboard after the spacebar: the Return or Enter key. It may be called either, or it may have a bent left-facing arrow, or some combination of these.

The "Return" label is a carry-over from typewriter keyboards because the key partially duplicates the function of the carriage return on a typewriter. The "Enter" label derives from the fact that in programming, or when some software, only when this key is pressed is the command or information actually entered into the computer.

One key normally found in a prominent position is that marked Esc. It's short for Escape, and when most beginners expect this key to get them out of all sorts of trouble. Unfortunately, the Esc key rarely does anything. In some programs it may live up to its name – by letting you retreat from some function, or exit from a subsidiary screen – but don't count on it.

Next come two keys that remove characters instead of creating them. The first is usually marked Del which stands for Delete, and the second is called Backspace and is usually marked with a straight left-facing arrow. The difference is simple: Backspace removes characters behind (to the left of) the cursor, while Del deletes characters in front (to the right) of the cursor.

Now the shift keys are not the only keys that alter the effect of keypresses. All keyboards feature a "control" key, usually marked CTRL. Like shift, Ctrl is used in conjunction with other keys, but often to produce special computing characters – for example Ctrl-G, which is the BELL character and produces a beeping sound. Ctrl combinations are widely used in software to control special program functions (the *WordStar* control codes are probably the best-known of these).

Recent years have seen computers sprout additional controlling keys, regardless of whether they are actually needed or not. You'll often find an Alt key which is an ALTernative shift, and on the Amiga there are Commodore and Amiga keys as well as two Alts and a Ctrl. This is simple insanity: the Commodore key does nothing except as part of the Ctrl-Commodore-Amiga reset combination and I've yet to find a software package that uses the Ctrl or Alt keys (most programs use the Amiga key exclusively).

Even a restrained sort of keyboard like the standard PC model shows overkill in key functions. For every alphanumeric key you can have unshifted, shifted, Ctrl-key, Alt-key, shift-Ctrl-key and shift-Alt-key combinations – nearly 300 functions from the alphanumeric keys alone.

On the sensible assumption that ordinary mortals can't hope to remember that sort of stuff, computer designers began incorporating a special set "function keys". Amiga and ST owners get ten of these, and PC owners may get ten or 12 depending on the model.

On older PC keyboards these keys are ranged vertically down the extreme left-hand edge, but on just about every other computer they're spread horizontally across the top of the keyboard. Either way, unfortunately, it's a losing proposition.

The problem is that the most intensive users of keyboards are people doing word processing, and most people who do word processing already know their way around the alphanumerics. The last thing they want is to start moving their hands into unfamiliar places because when they come back they start hitting the wrong keys. So software houses don't really use the function keys – they'd rather make you type Ctrl-K-D when you want to save a document.

The next most obvious collection of keys on the more up-market keyboards is the numeric keypad on the right. This originated on business computers and was designed for spreadsheet, accounting and other financial applications, and usually duplicates the layout on adding machines and calculators.

On some keyboards the numeric keypad also incorporates the cursor control keys. You switch between the number and cursor functions via the Num Lock key. (AT-standard keyboards, as well as other more generous models like the ST and Amiga, provide you with dedicated cursor keys in addition to the numeric keypad.)

Num Lock is one of an unusual group of keys that differs from all the others. These keys are hard-wired and perform fixed functions (most other keys are software controlled so it is possible to assign any character or function to any key). These hard keys are most commonly found on PC keyboards and include Scroll Lock (which prevents the screen from scrolling when printing passes the last line), and a Reset key which acts in identical fashion to the normal PC reset combination of Ctrl-Alt-Del.

Finally, different keyboards offer a variety of specialist keys. Perhaps the most notable is the Amstrad PCW's. Designed for word processing, these keyboards they have a large number of keys that perform special WP functions – one reason why *LocoScript* (the 'standard' PCW package) can be amongst the easiest to learn. The PCW is also virtually the only machine boasting software that makes consistent use of these specialised keys.

The key to the future?

So, the computer keyboard is a complicated crittur – traditional keyboards were just for typists or teletype operators, but computers have to cater for spreadsheet users programmers, and computer-aided designers, and all the other users of specialist software. And all of these people make different use of different sets of keys.

There is probably no way out of the problem until the voice-recognition problem is solved. But that's another story ...

ST

Hard disk backup

You tend to forget about backups when you've got a hard drive attached to your system. Until the drive goes down and you lose all your data, that is. After that you'll want to know what can be done to prevent the same thing happening again.

In all honesty, nothing can be done. If your hard drive wants to call it a day there's nothing you can do about it. Of course, you could copy all the files onto floppy at the end of the day. But have you tried doing that! You could be there for hours; backing up in excess of 20Mbytes isn't a sport worth taking up.

Third Coast Technologies reckon to have the solution. But this remedy is strictly for power users or those with large – very large – wallets.

FA-ST Tape Backup, as the system is called, can be likened to cassette data storage – just much faster and much more reliable. The unit is stand-alone and offers DMA in and out. It's compatible with Cumana, Third Coast, SH204, Megafile and Supra range of hard drives. It provides a DMA out for hard drives which lack such a socket. It also comes with a battery backed clock and supports an internal embedded SCSI drive. The tape streamer and SCSI drive can be enclosed in one unit – full details from Third Coast.

Propellor heads here goes: 155.7Mbytes on a single data cassette; average read/write speed is 116.2Kbytes/second (roughly 6Mbytes/minute); TOS, MS-DOS, Spectre 128 and Magic Sac partitions; error rate on a par with hard drives.

Incidentally, the Mac emulator – Spectre 128 – being distributed in this country by HiSoft can't read and write Mac disks directly as suggested a few weeks back. Instead a hardware widget must be attached to the ST that allows the drive controller to perform to Mac standards (that is, spin at variable rates – faster on the outside and slower towards the centre). Details on how the interface work, or where it plugs in, are sketchy. However, it is known that the device is ready and the software is being written. HiSoft hopes to be distributing the gadget by June.

Back to FA-ST. It costs £873 including VAT. Information from **Third Coast Technologies, Unit 8, Bradley Hall Trading Estate, Standish, Wigan, WN6 0XQ** (0257 426464).

Fright Night?

Confused? I know I am! Doubtless you've heard plenty about Microdeal's computer version of *Fright Night*. You're probably aware that it isn't coming out on the ST as programmer Steve Bak wants to head a development team rather than pump out code himself.

Well, you'll be surprised to hear that *Fright Night* is coming out on the ST. However, it won't be like the arcade game recently released for the Amiga; instead it will be *Fright Night* the adventure game. Amiga owners will really be in for a hard time as *Fright Night* will be available in both arcade and adventure format. Microdeal on 0726 68020 should be able to tell you more than the £19.95 price.

Fontastic fonts

The ST Club at **9 Sutton Place, 49 Stoney Street, Nottingham, NG1 1LX** (0602 410241) has finished work on the *Fontkit Plus* Accessory Pack. The Accessory Pack lets you grab characters or images on screen and convert them to GEM0-font format. There's also provision for converting Signum fonts to GEM fonts. The utilities to create GEM fonts and images from other formats will be of particular use to those who need professional results without the hassle of creating fonts form scratch.

The Accessory Pack is available from the ST Club for £4.95 (£3.95 to registered *Fontkit Plus* users).

Also from the *ST Club* is the *Fontpac* Series – a set of fonts on disk. These range from the austere to the ornate. The first two disks contain downloadable fonts for the Star NL10 and LC10 9-pin printers. Fonts include Elegant, Macintosh, Banks New Fancy, Caligraf, Gary Gothic, Orator, Slab Serif, Polish and many more. Other disks in the range contain fonts for the Brother and similar popular printers. Each disk costs £2.70.

Virus book look

The second edition of Price Waterhouse *Computer Virus Handbook* is now on the shelves. Everything you wanted to know about viruses, worms, trojan horses and other malevolent programs but were afraid to ask can be found in the pages. Version two contains 11 new strains including *ARPAnet worm* Atari ST Virus, *Creeper Reaper* and *Rabbit*. There's not much ST specific material so you might find it hard justifying the £15 price. *The Virus Handbook* is available from Price Waterhouse Management Consultancy, 1 London Bridge, London, SE1 9QL (01-378 7200).

Adrion McHerriot

Game cheats

● ***Speedball: Keep pressing the F1 pause key just after the ball has been released; this makes it easier for you to reach the ball first. Also try to use the holes on the side of the pitch to pass upfield. When your keeper comes into view, and the opposition have the ball, concentrate on using the keeper to stop the ball instead of trying to tackle with the other player: your opponent will usually throw the ball before you reach him and sliding tackles cause the keeper to dive the wrong way. Off-the-ball barging helps reduce your opponent stamina. Only use the tokens to buy extra goals, more stamina and skill.***

● ***Elite: Not really a cheat this one; more of an interesting discovery. Press one of the arrow keys when the ship starts rotating on the introduction screen. This stops movement. Pressing the arrow keys forces the craft to move in the direction of the arrow. Also, 'I' zooms in, 'O' zooms out, 'A' toggles between X and Y axis movement, 'D' restarts rotation, 'F' forces the next ship to appear.***

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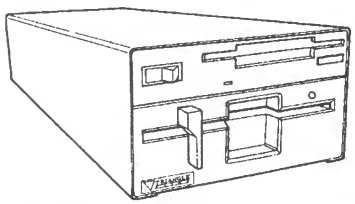

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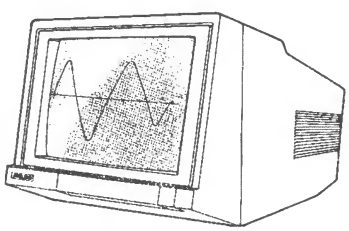

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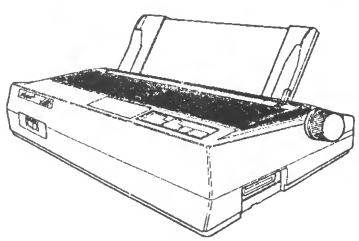

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PC UPDATE

New games

Having worked my way through BBC Micro and Amstrad CPC, I haven't made much mention of games in this column, as the PC hasn't really had the capacity for decent graphics or sound. Magenta skin tones and white landscapes are pretty unconvincing, and the occasional beep from a PC's speaker doesn't create much of an atmosphere. There are signs that things are changing, though.

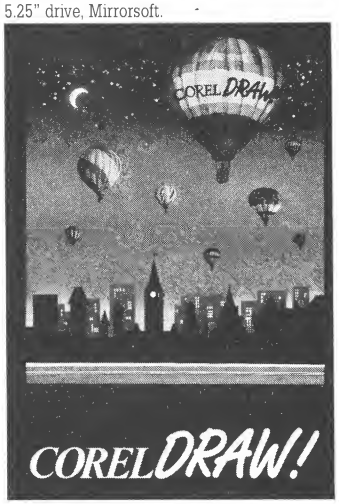
The default graphics standard is climbing week by week, with more machines being bought as standard with EGA graphics, and many now sporting VGA. With EGA it's possile to get quite reasonable graphics onto the screen, and with VGA a good few 'games' machines' can be put to shame. *Battle Chess* is now available on the PC and really looks the part with smooth animation and some lovely digitised sound samples. Very playable and proof that the PC can make good sound, as long as you have room on the disk for the samples. Logotron's *Star Goose* is also out on the PC and I'm told looks equally good, though I haven't seen a copy yet.

While on about sound, the PC's main failing, I can't understand why some enterprising hardware supplier hasn't tried to set a standard with a sound chip expansion card. You would have thought a reasonably priced card could have been put together with at least the chips used on CPC, ST et al. With the right marketing to home users of PCs, and some support from software houses, it could be a nice little earner for the hardware company, an added selling point for games suppliers and a bonus for the PC user, who'd have a more authentic game. This, after all, is how Kempston made its name on the Spectrum scene, only with a joystick standard, rather than sound. There's a bigger potential market than with any machine bar the Speccy.

MS-DOS

Here's another other story about a laptop. Once I'd connected the 5.25" external drive to the Zenith, I thought I'd try running my favourite non-zapping game of all time, *Tetris*. The program started OK, but then searched through all the drives looking for its key disk. Silly thing didn't seem to consider the external C drive as a legit source and refused to run.

If you know something of the darker secrets of DOS, you'll know there should be a simple solution to this. The SUBST command lets you substitute one drive for another drive, or a directory on a drive. The command A:SUBST A: C:\ from the C: drive, for instance, makes C: into A: and throws A: out of the window, as far as DOS is concerned. With this trick in place, *Tetris* should look on the external drive for its key disk. Unfortunately *Tetris* pays no heed to DOS and still claims there's no keydisk in drive A: or B:. This must be pretty frustrating for anyone with only an external 5.25" drive, Mirrorsoft.



You can, of course, use SUBST to less subversive ends, like creating 'pretend' logical drives on a hard disk. I have a SUBST command in the AUTOEXEC file of my hard disk to turn C:\GEM into drive G:. Thus I can treat all GEM directories as if they are on a separate drive from the rest of the contents of C:.

Drawing conclusions

The advent of VGA has brought all kinds of interest from companies producing graphics packages. Two of the latest are *Corel Draw* and *Adobe Illustrator*. *Corel Draw* majors on type effects and colour output. It claims over 50 fonts with numerous pattern fills and effects, and the ability to produce colour separations with full Pantone and CYMK support.

Adobe Illustrator is a rework from the Mac version, which has become something of a standard for drawing and illustration work on that machine. The PC program works under Windows, as does Corel Draw, so no doubt both suppliers have eyes on OS/2 and *Presentation Manager* versions. *Illustrator* is aimed at users who want PostScript output from their PCs, and includes *Collector's Edition*, a set of clip art symbols, borders and letterforms.

Both packages offer DXF conversion, which allows them to import *AutoCAD* drawings, and *Autotrace*, which will take a bit-mapped image and convert it into an object-oriented graphic. Neither package is cheap, with *Corel Draw* coming in at £350 and *Adobe Illustrator* costing a bouncy £595, both with added VAT.

Simon Williams

Laptop confession

OK, I've gone and done it. Having failed to get hold of a Comcen laptop (see PC Update 17) as they had none in stock, I went down to Plymouth to see a Zenith supersPORT (their capitals). And what a nice machine – twin floppies, 2.5hr battery pack, DOS 3.3 Plus, serial and parallel ports, and sockets for extension floppy (hooray) and monitor. It also has 640K as standard and spaces for an extra megabyte, a maths co-processor and an internal modem. Top Deck, the Plymouth dealer (0752 791800), also throws in a pukka all-zip-and-velcro carrying case and a copy of the Lap-Link communications pack. All for £1,058, which may seem a lot – but for one thing. The ZFE184-1 has quite definitely the best LCD screen of any portable.

There are plenty of high-end 20Mb hard disk jobs with excellent gas plasma displays, assuming you like shades of pink, and there are rumoured to be colour LCDs just around the corner (guess how much they'll be?). For the moment, though, the back-lit Zenith display, which shows blue text on a silver-grey background gets my vote for the most readable screen on a laptop.

The Zenith also got my money, rather more of it than I wanted to spend. Nevertheless, I've since got my extension floppy working with it, but that's another story.

AMIGA BLIT

IFF: The Only Way is Up!

The IFF file standard is truly a wonderful thing and must surely be one of the Amiga's greatest assets. After all, what other machine can boast the kind of data-portability that the Amiga offers. If you draw a picture, compose a piece of music, generate an animation even, chances are that it'll load into another similar program with little or no modification whatsoever; try doing that on a PC or an ST!

A lot has been happening on the IFF development front over the past couple of months and it seems that Commodore may at last be listening to the suggestions of the average Joe Public.

Probably the major news, sure to be greeted with considerable interest by many Amiga users, is the announcement that Commodore-Amiga are soon to release a standard IFF library. The library will be disk based and will be accessed in the same way as current disk-based libraries such as diskfont.library and icon.library etc, using the Exec function, OpenLibrary(), to gain access to the library routines.

The Library will provide programmers with a standard set of core routines for handling IFF data chunks of all types. This will not only be great news for programmers, as it makes IFF support easier to incorporate into programs, but it should also make IFF even more portable than it already is. Form specific libraries, for handling particular IFF types, should follow soon after from Commodore-Amiga.

Other announcements include the addition of several major new IFF forms. Commodore US has been working closely with third party developers trying to make all data, regardless of its type, conform to an Amiga industry standard. Consequently, data types soon to fall under IFF control include MIDI data, MIDI-compatible samples and others.

Unix + Amiga: The killer combination

Commodore's much publicised Unix-based Amiga, the A2500UX, looks set to become an instant hit when it is eventually released later this year(ish).

According to Rob Waite of Spire Communications, Commodore's PR company, Commodore has been steadily increasing industry awareness of the new Amiga by publishing advertisements in vertical market publications and sending out press releases to specialists sectors of the high-tech industry.

The 2500UX has previously been seen only once in this country, at last months *Which?* show, but early signs suggest that the machine has been greeted with considerable enthusiasm from all sectors of industry. Even big names such as Plessey and GEC have made inquiries about the machine. All this interest has left Commodore sales staff kicking themselves, as they have a huge number of potential customers, but nothing to sell them.

Rob, calling upon his usual strange blend of English and other ancient dialects, described the reaction as 'Humungus' (Rob assures me this is an old Australian term meaning colossal).

Message Port

If you have any views on any issues raised within AmigaBLIT, or even the Amiga scene in general, then Id like to hear from you. Similarly, if you have any tricks, tips, cheats or tactics for the latest Amiga games then why not share them with your fellow Amiga owners; not only will you be helping other Amiga owners, but you'll also be famous!

Send your tantalising tips, oodles of info and bribes to: AmigaBLIT, New Computer Express, 4 Queen Street, Bath BA1 1EJ

Stop Press!

I can always find space for a damned good news snippet in *AmigaBLIT*, and this week's column is no exception! News has just reached my ears that Commodore are soon to release a new Rom Kernel manual, published as always by Addison-Wesley, called *Rom Kernel Manual Includes and Autodocs*. It doesn't take a brain the size of two planets to work out from the title what the new manual documents. Look out for it in your local Amiga computer store real soon(ish).

At Last! A Working Sword of Sodan Tip!

Oops! It seems that the last so-called mega tip for Discovery's *Sword of Sodan* didn't technically do precisely what it was supposed to do (which translated means that it didn't actually work at all!). All I can do is issue the usual grovelling apologies all round. unfortunately at the time, I didn't actually have the game so I couldn't test the tip.

Moving on quite nicely (and why not?), I present my latest peace offering; a 100% working, guaranteed for five years with parts and labour costs thrown in, rust-proof tip for *Sword of Sodan*. Why am I so confident that this tip will work? well, I have gone to great lengths to test it personally myself.

So, fancy infinite lives (why do I get this feeling of deja vu)? All you have to do is to play a game as normal but make sure you loose all your lives on the first screen (which I didn't find overly taxing!). When you are asked whether you would like to see a replay, select Yes and then wait. Once you've done that and the action replay starts, press Q straight away, start another game and you will have infinite lives!

Jason Holborn

Pageplay

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SPEX

Rock Star Ate My Wallet

After getting off to a shaky, not to say rubbish, start it is good to see the Code Masters Plus range come up with a decent product. Remember, this was a new label offering more

complex and involving gameplay than budget title – oh, and 7 more gold coins per sale in the Darling brothers' industrially reinforced pockets.

Rock Star Ate My Hamster it's called, and amazingly enough for a Code Masters release, you won't find any trace of Ninjas, BMXs, Simulators or that Dizzy character. What you will find, however, is some sincere, honest and unbiased quotes on the cover, along the lines of "Completely brill and wicked. Buy four copies today" – Richard Darling.

Surprisingly, though, *RSAMH* plays really well as a pop group management simulator and as a computer game that deliberately tries to be funny, almost is. When compared to some of the Fergus McNeill adventures and the so-bad-it-was-good *East Enders*, it's not hilarious, but I'll admit to a few out-loud chuckles when no-one was looking. After all the gratuitous violence, commie bashing and strip poker filling up the market, it's good to see a computer game bring a little laughter into this weary old world.

Having said that, anyone who insults the legendary name of rock idol Cliff Richard by calling him *Stiff* Richard should watch out. We Cliffettes don't take kindly to it, I'll tell you.

A real tip

Here's another valuable piece of ammo in the endless war between human and computer. Putting it slightly less dramatically, type TREASURE in Activision's newie; *The Real Ghostbusters* to skip the current level.

Huge thanks go to Richard Garrood of Aldershot for that one. (More from him later.)

Any other tips, pokes and cheats for Spectrum software (serious stuff included) needing a good home should be scribbled on the first thing that comes to hand and rushed to: **Robin Alway, SPEX, New Computer Express, 4Queen Street, Bath. BA1 1EJ.**

Boot on the other foot

If you can survive the smoke and mentally deranged psychos playing *Operation Wolf*, make sure you visit your local amusement arcade sometime soon. That great Spectrum coder Jon Ritman (author of *Match Day, Batman, Head Over Heels* etc) is back, and his latest project has been written for something just a tad more powerful than the Speccy.

Rare (Ultimate as was) is set to unleash a coin-cop footy game written by Mr Ritman. I can't wait to see what relation it bears to his Speccy stuff.

In fact, it might well be worth dusting off your copy of *Match Day*, just to get in a bit of practice. These arcades aren't cheap places, you know.

Cruel rumours

If I hadn't been at my most understanding this week, one letter from a certain Richard Garrood would have been straight in the cylinder-shaped filing cabinet labelled Bin. Craftily tucked away inside the envelope was a classified ad trying to sell a +2. The cheeky chappy actually said in his letter "Please pass the ad on – I'm so busy saving up for an ST that I can only afford one stamp." You can't blaspheme like that in front of a Spectrum wordshipper! Generous as ever, though, I've decided to let the writer of said letter off. Firstly, because he said the April 1st *Computer Excess* pull out – "was brilliant! I haven't laughed so much since I bought *PCW* once!" (What can he be referring to?) Secondly, like me, he was pretty damn curious about a news item printed in Spectrum-specific mag *Crash*, concerning a plethora of Speccy add-ons from Amstrad.

The Snubware Show

The latest attempt at producing a television programme for home computer users has been, gone and managed to brass me off in the process.

The Software Show wasn't all that bad. BBC TV's Mr Computer, the one and only Fred Harris, didn't show his face – which came as a huge relief. And the topics covered were a bit more relevant than you used to get in Micro Dead.

No, the main problem from my point of view was the absolute absence of Britain's best-selling computer. Yes, your friend and mine, the Spectrum. Littered through the whole thing were a distressing amount of non-Speccys, all of them more expensive and all of them less popular. It's pretty stupid trying to cover computing in the home without featuring the one machine that's in more homes than any other, don't you think? It might not have the words BBC emblazoned on it, but sheer weight of numbers means our rubber friend deserves coverage.

Mind you, the Beeb's sanity always has been in question, I mean showing a program like Going for Gold doesn't exactly suggest sound presence of mind in anyone's book.

At first I thought this was particularly unfunny and cruel April Fool's joke. This is un-user-friendly Amstrad we're talking about. The company which has been responsible for evils like the rewiring of joystick ports, +2As and of course the buy-out of our beloved Sir Clive in in the first place.

The item mentioned a host of new products for Spectrum owners, including a word pro package with printer and software, a special interface to banish those +3 tape loader blues and – hip, hip, hooray – a stand-alone 3" disc drive.

All this was rumour, so don't go building your hopes up quite yet. I'd wait for the official news story in *Express*. At the time of writing nothing has been forthcoming from Amstrad. If it does turn out to be true, it will be an amazing turn around. What's prompted Uncle Al to be so kind? The Spectrum is the best selling home computer in Britain and has been for a long time. Maybe he's finally realised what huge amounts of easy money were passing him by. On the other hand, maybe some incredibly witty (OK, half-witty) journo is leading us up the garden path.

Richard goes on to recommend the Vidi digitizer from Rombo. "I use it often – it's really easy" he said. This add-on costs a very reasonable £34.95 from Rombo Productions on 0506 39046. If you've got software or hardware recommendation, send it in.

Robin Alway

SECTOR 64

The unknown programmer

Do any of you remember the early days of the computer industry? When programmers used to get all that credit for their work? Because if you compare those times with the situation theses days you can see a clear difference.

It's said in one way, because at one time programmers were proud to see their game on the market and being reviewed etc, but with the move away from original game ideas, these days there are people out there who have written so many conversions they've forgotten which ones they've done!

• **Terramex, by Peter Harrap: One of the few really original games still available?**

We just wish there was at least one company out there which would produce an original piece of software, one that didn't bear a resemblance to an arcade game.

Some of the best original releases are platform-type games, in which you control a cute or ugly character you can either fall in love with or laugh at. Our all-time favourites include *Monty Mole, Monty on the Run* and *Chuckie Egg* (now on the Amiga). Remember *Thing on a Spring*?

The man behind quite a lot of these games is Ratt (Tony Crowther), who seems to be trying to keep the originality going with *Bombuzal* – well worth a look if you haven't seen it already. Another famous name in this field is Peter Harrap, who is also trying to keep things back in line with *Terramex*, an arcade adventure written for all the formats available and, of course, *Pacmania* on the Amiga.

Maybe when companies are fed up of the sight of arcade machines we may see some originality (but we doubt it).

Cheats

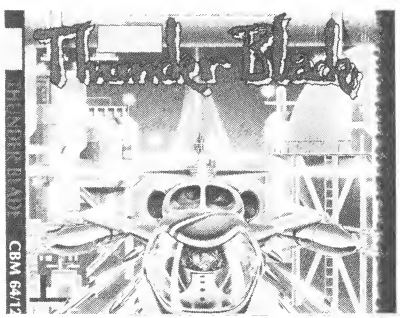
▪ The first of this week's tips comes again from the master of hacking, Gary Gaud. For infinite lives in *Chubby Gristle*, type the following poke after reseting the machine:

POKE 3613,173 (return)
SYS 2994

▪ Secondly, from Martin Little in Clevedon comes a cheat for *Thunderblade* to get you past those mobile fortresses at the end of each stage.

Just before you get to the fortress, before the guns start firing at you, press [RUN/STOP] [SHIFT LOCK] [S] and [F3]. Your helicopter will now reverse into a load of scrambled graphics. Keep your fingers on the keys (so that it keep reversing) until up comes 'finished stage 1, 2, etc'. This takes about 20 seconds.

Ian + Mic



Scroll listing

```
0   B=50176
1   FORL=0TO214:READA:POKEB+L,A:NEXTL
10  DATA 162,0,189,1,4,157,0,4
20  DATA 189,41,4,157,40,4,189,81
30  DATA 4,157,80,4,189,121,4,157
40  DATA 120,4,189,161,4,157,160,4
50  DATA 189,201,4,157,200,4,189,241
60  DATA 4,157,240,4,232,224,40,208
70  DATA 209,162,0,189,25,5,157,24
80  DATA 5,189,65,5,157,64,5,189
90  DATA 105,5,157,104,5,189,145,5
100 DATA 157,144,5,189,185,5,157,184
110 DATA 5,189,225,5,157,224,5,232
120 DATA 224,40,208,215,162,0,189,9
130 DATA 6,157,8,6,189,49,6,157
140 DATA 48,6,189,89,6,157,88,6
150 DATA 189,129,6,157,128,6,189,169
160 DATA 6,157,168,6,189,209,6,157
170 DATA 208,6,189,249,6,157,248,6
180 DATA 232,224,40,208,209,162,0,189
190 DATA 33,7,157,32,7,189,73,7
200 DATA 157,72,7,189,113,7,157,112
210 DATA 7,189,153,7,157,152,7,189
220 DATA 193,7,157,192,7,232,224,40
230 DATA 208,221,96,96,96,120,173,18
240 DATA 208,201,255,208,249,173,22,208
250 DATA 201,192,240,5,206,22,208,88
260 DATA 96,173,22,208,24,105,7,141
270 DATA 22,208,32,0,196,88,96,0
300 SYS50357
```

● *Do you love listings? Well, this week's little codesmasher will scroll the entire C64 screen pixel by pixel. Each time you SYS 50357 it will move one pixel to the left. Could come in handy one day. Just type it in as printed – lines 300 onwards are yours to do with as you wish.*

● *How the scrolling works is simple. All the computer does is look at the whole tope line one position over from the start and places it back one. And to make the screen scroll smoothly we just decrement location 53270 8 types then reset it back to the top and move the whole screen over one block – voila! Now you can write your own scrolling Sector 64 style game.*

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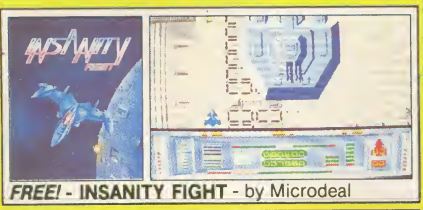

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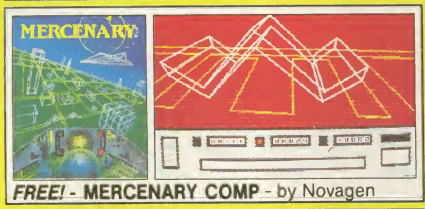

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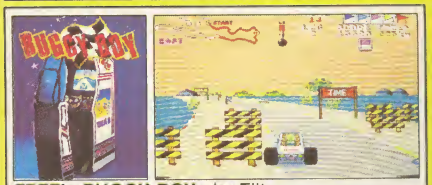

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PCW PATCH

Stand up for your whites

April is Britain's rainiest month, so fo course it's the start of the cricket season. The PCW is an ideal statistician for any cricket scorer and if you want to automate your club's figures several possibilities exist.

1. Write a simple BASIC program or get one written (ask friends/ check small ads in *8000 Plus*) which can maintain your averages/ produce scorecards for a match etc.
2. Do the same with a spreadsheet (*Mini Office Professional/ SuperCalc* etc. are ideal)
3. Buy Stephen Fearnley's Averages program for £10 (88 Abingdon Road, Drayton, Abingdon OX14 4HT)

Toys will be toys

April's 8000 Plus magazine included a spoof review of LocoToy, an add-on to LocoScript, which feaured on-screen simulations of Newton's Cradle, a mobile, a cheese plant and a snowstorm (which involved turning the PCW upside down). A joke, of course, as was the ad for LocoToy in the same issue (to be sent to 'Isabel Ringing'). Unfortunately many were taken in and Locomotive has had to reply to dozens of requests for LocoToy. Its reply letter (from 'Isabel Ringing-Now') is commendably tongue in cheek.

Nothing that will let you maintain a score through a match (in a similar fashion to the TV scorecard computers) is currently available. Such things would be dead easy to write and given that there are several thousand cricket clubs most of whom must have access to PCWs and a plug in the pavilion, there's a market. So get writing, someone.

Ridiculous link

Cricket is of course very popular in India, and anyone who's been there will tell you how long everything takes. Time does not exist; the Hindi word for 'tomorrow' is the same as for 'yesterday'. It's all rather like life as a PhD student, many of whom are frantically writing up now, only a few years past deadline.

The PCW is an ideal machine for writing a thesis and it's rather surprising the relative lack of academic software there is for it. A bibliographic database is available though in the form of *Paperbase*, £49.95, from Wight Scientific (01 858 2699). You make ASCII versions of your thesis files with your references in the standard forms (you can define special forms if you like) and *Paperbase* automatically compiles lists of the references in a new file, sorted and arranged in various ways for you. Ideal for academics.

Saved on the line

It's a bind constantly having to save a BASIC listing as you type it in, run and test it. If, however, you make the last line something like 10000 SAVE "FRED then every time the program is run, it'll also be saved in its current form.

Basil Pigg

QL corner

QL computerised bulletin board systems

Two *Quanta* members, Stuart McKnight and Laurence Reeves, have developed a bulletin board software package for the QL called *QView*. It is Prestel-compatible, so can be accessed with the cheap and cheerful Miracle modem mentioned in the last issue. The package sells for £50, and you get £20 off the Astracom modem supplied by TF Services (01-724 9053) if you set up a CBBS using *QView*. Stuart and Laurence have set up their own CBBSs – ATAVACHRON on 0480 412884 and LAU on 01-751 6096. They both use the ring-back system - dial the number, let it ring a couple of times, hang up and redial. The systems are on 24 hours a day.

Also using the *QView* package is Sector Software on 0772 454328 after 6pm and all day at weekends, and QL S.U.B. on 0388 773737 (ring-back).

Using OPD Microdrives on the QL

J and N Bull of Brighton is selling twin Microdrive assemblies from the ICL One Per Desk for £5. Leighton Davies of *Quanta* recently wrote an article for the group's newsletter describing how to modify them for use as external Microdrives with the QL. ICL redesigned them for the OPD, and Leighton reckons he consistently gets far more good sectors formatted than with his original drives. By the way, the OPD was also sold by British Telecom as the Tonto. I doubt if it sold very many in Spain – 'Tonto' means 'stupid' or 'silly' in Spanish...

Alternative Micro Show

There were many more QL-related stands at the Alternative Micro Show than for any other system. DP seemed to be attracting a lot of attention with The Solution, which was the only major new software product on show. Miracle Systems was demonstrating its new hard disk system. It is now running quite a bit faster than the last time I saw it (the driver software has been speeded up), and Miracle reckoned it is about ten times faster than a floppy drive.

EEC Ltd was selling QLs at bargain prices, including working QL boards for £25 – several people bought them for spares.

QL Adventurers Forum

Richard Alexander recently sent me a copy of his latest *QLAF* newsletter. Contents included a beginner's guide to adventure and strategy games, reviews, notes, maps etc. The group also has a library of public domain games. Highly recommended if you are interested in adventure-type games on the QL. Subscription is £5 for six issues, from CGH Services, Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA. Cheques payable to Richard Alexander.

John Torofex

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Whompf no, Crrump it went, just about the loudest bang you are ever likely to hear. The polystyrene ceiling tiles in the office bounced down, and then up and the windows rattled in their frames.

But as a fine dust settled we quickly realized that we were lucky. Next door the windows were blown out, and the ceiling was down. Farther down the road, roofs were blown off and debris was scattered everywhere. In fact the whole area looked as though it had been strafed by the Luftwaffe. What happened was that a van carrying explosives had exploded not more than 200 yards from our office killing one fireman and injuring eighty. The resultant blast had devastated a large area with the damage running into millions of pounds.

What's this got to do with computers, you may well ask? Frankly nothing, but for the fact that our BBC computers carried on running sweetly throughout with nary a hitch. Guess what happened next, yes you guessed it your inestimable editor phoned requesting some copy. At least this time I had a good excuse!

Acorn ups the ante

Most computer firms find that the best way to sell more machines is to reduce prices. However Acorn have decided to try and buck this trend by actually increasing prices. A Master 128 goes from £399 to £439, and an Arc 310 from 835 to 899. At the same time it has also set educational price levels at £349 and £720 (all excluding VAT of course) respectively.

All this takes place from April 3rd, so by the time you read this it will be too late to get round the increases. At first sight the changes seem wholly without logic. Acorn's pricing policy has always been one of their weak points, and to tinker with it now would appear to be madness.

However, a little analysis might prove illuminating. Acorn has the education market sewn up, and that is a fact. It has done this by virtually giving away large numbers of machines. Now it can afford to stabilise prices, and clean up.

As far as the home market goes, I would guess that the changes reflect the forthcoming home Archimedes, and the furious mail order discounting that has been going on recently.

Where does all this leave the average punter? Pretty confused I should say, and angry that Acorn once again have moved the goalposts. It will also stimulate the flourishing second hand market still further.

Andrew Brown

Second hand bargains

If you are in the market for a used Beeb then I suggest you go for an issue 7 model, they are usually more reliable. Avoid machines with the 8271 chip, and watch out for cracked boards, loose ROM sockets and damaged disk drive connectors.

MSXTRA

Read only

So far I haven't touched on the subject of books for the would-be MSX programmer, mainly because many are out of print or are slightly dated.

One book though that you still might find available from the better MSX stockist is *The Complete MSX Programmers' Guide*, published by Melbourne House. Although this book appears to be out of print, I have seen it at knock-down prices in certain computer stores. Its original price was £14.95, but even at this price it was a bargain. For anyone thinking of using their MSX for more than games, or who would like to write BASIC programs or delve into machine code, this book is a must. When this book was first published it was voted the best reference book for any home micro on the market. Try D L Chittenden Ltd on 0494 784441. I know that they had a few copies in stock, though at the full recommended price.

Scotch must

I have already mentioned several MSX user groups in previous editions of this column, but so far have failed to mention the only MSX user group to be based in Scotland. The group is called *MSX UK* – not *MSX Scotland*! Presumably the thinking is that the name will bring in members from a wider area, even abroad.

The group is run by Craig Bell, and it publishes a monthly 12-page colour newsletter (which I have yet to see) for the yearly membership fee of £6.95.

The address is **North Lodge, Cairnhill Road, Airdrie, Lanarkshire, Scotland ML6 9RJ**. That's the plug for the group Craig, now how about a copy of the newsletter?

Keith Neal

Playtime

Latest news for MSX gamesters is that Nemesis 3 is now available, and although I've yet to receive a copy for review, it should prove to be every bit as good as Konami's previous Nemesis series releases.

Blasteroids, from Mirrorsoft, should also be available as you read this, as should 3D Pool from Firebird. The main feature of this latter game is the ability to walk around the table and view the shot from any angle – quite a feat of programming. 3D Pool is due for release on the 18th April, priced £7.99.

I'm often asked if it's possible to buy joysticks with two separate fire buttons, as many Konami games require this feature to play them successfully. Three to look out for are the Captain Grant at £16.95, the Euromax MSX at £18.95 and the Quickshot V from around £10. Tavistock Hi-Fi of Bedford (0234 56323) stocks the Captain Grant, Nightdare of Torquay (0803 606146) stocks the Euromax and the Quickshot V can be found on many market stalls which deal in electrical products.

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CPC centre

Insider trading

Take a look at the Microbiography in this issue of *Express*, for it concerns the CPC – which as you may or may not know celebrates its fifth anniversary this very week (11 April, 1984, to be precise).

It's easy looking back to assume that everyone expected that the CPC would be a massive success, but in fact it wasn't like that at all. At the time Amstrad was known chiefly for its not very special car radios and hi-fis, and must have looked a very risky bet to succeed in the quagmire of home computing, where so many others had failed – and continue to do so. Indeed, I know of only one person involved in the project (I can't name him) who had the confidence to invest in Amstrad shares. He bravely sank his life savings into them – and watched as they rose by a factor of ten over a single year!

Incidentally, there's a slight twist to the now famous story of 'Arnold,' the codename for the secret new machine. Richard Clayton of Locomotive Software was one of the very first to see the prototype, when it had actually been labelled 'Arnold' on the plastic casing by project co-ordinator Roland Perry. (Perry claims it wasn't for months afterwards that he realised – or more accurately had it pointed out to him – that Arnold is an anagram of his own name!) But, as Clayton recalls, when he opened up the prototype, there was the word Amstrad printed in big bold letters on the circuit board! It's fortunate that he'd never heard of the company, for otherwise he might not have been so keen to become involved.

Football madness

All of a sudden, for some reason I'm quite unable to fathom, football simulators are flooding onto the market faster than novelty knickers at Christmas. Code Masters was quick onto the wagon, natch, with Four Soccer Simulators, with the spin-off Street Gang Soccer soon to follow. Then there's the leadenly entitled Microprose Soccer. And of course there are the usual name-games: Emlyn Hughes International Soccer, Gary Lineker's Hot-Shots and Steve Carey's Thundering Left Foot Volley Goes Miles Over the Bar Simulator.

Now I've always been a Matchday II man myself, a game I find myself returning to frequently. But I've seen pre-production versions of both the Crazy Horse and Gazza soccer sims, and I must admit that they look as if they'll be serious competition for the old Ocean classic. And although the Microprose game was originally written in the states I'll wager a small bet that it too will have the usual mark of quality.

But that still leaves the question: why so many soccer sims all of a sudden?

Chris Price is a Cheat

Ex-teacher and professional programmer Chris Price is the last person you'd expect to be encouraging people to cheat. Chris left teaching to work as a full-time programmer and has worked on such projects as *Fun School 2*, *Red Arrows*, *Mini Office* and *Micro Olympics*. But now, with 1st Choice Software, he's a gamekeeper turned poacher (or something like that), for his first releases are two packages of Choice Cheats. Volume One will prevent you getting 'zapped' in *By Fair Means or Foul*, *Cybernoid*, *Operation Wolf* and nine others; Volume Two does the same for *Bad Dude V*, *Dragon Ninja*, *Arkanoids I & II*, *Head Over Heels* and half a dozen others.

Each costs a fiver on disc or £3 on tape from 1st Choice: phone 0706 72728.

Immortality for Ikari Warriors

And while we're on the subject of infinite lives, cheats, pokes and all that stuff, here's one for free.

It's always been a favourite game of mine, has *Ikari Warriors*, ever since I got it for Christmas back in '86 (pity I didn't get a computer until the following summer, but there you go). It's a great graphics, two-player *Commando*-type (remember Commander?) smooth downward scrolling, mindlessly

addictive, guns 'n' grenade blasting, bombs 'n' bullets jungle shoot-em-up. Get the picture? Anyway, my big problem, of course, was getting shot down in flames and killed on a permanent basis much too soon. I got pretty tired, I can tell you, of having to pick myself up, dust myself down and start all over again.

So this short disc poke is just the job: you simply type it in and use it when immortality takes your fancy.

```
1'Ikari Warriors - disk
2'by Brian Warming
3'NCE 15/4/89
3Ø FOR a=Ø TO 51
4Ø READ a$
5Ø POKE 64+a,VAL("&"+a$)
6Ø NEXT a:CALL 64
7Ø DATA 3E,FF,CD,6B,BC,Ø6
8Ø DATA Ø9,21,6B,ØØ,11,ØØ
9Ø DATA Ø1,CD,77,BC,21,ØØ
1ØØ DATA Ø1,CD,83,BC,CD,7A
11Ø DATA BC,3E,Ø1,32,77,Ø5
12Ø DATA 3E,4Ø,32,B1,ØE,3E
13Ø DATA 4Ø,32,EB,5C,C3,ØØ
14Ø DATA Ø1,49,4B,41,52,49
15Ø DATA 2E,47,41,4D
```

Every Second Counts

Don't know if you have any time for that undersized immensely irritating magician Paul 'You'll like it, but not a lot' (all together now, OH NO WE WON'T) Daniels. No, neither do I. But an aged aunt of mine who thinks the sun shines out of his fundament told me very excitedly that 'one of those Seepy Cease you're always going on about, sonnie' was a prize on *Every Second Counts* a couple of weeks ago (1 April actually, but this is not, repeat *not* a delayed April's Fool story). Oh alright then I'll come clean, it wasn't my aunt it was me: I was that couch potato.

A cruel friend, who shall remain nameless (in fact it was *Express* editor Rob Ainsley) viciously enquired whether, if the second prize was a CPC, was the third prize two CPCs? Ha ha Rob, most amusing. On a more serious note I'd suggest that the idea came from *Which?* magazine. Last November the CPC was recommended yet again as an excellent low-priced computer. Not that we need telling, of course.

Steve Carey

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TECH TIPS

HELP!
Not switched on

I recently bought a Commodore A500 computer after recommendations from friends at college. When I got it home, I experienced a certain amount of trouble trying to switch it on. I have checked the wiring in the plug and the power cable is correctly inserted into the computer but I cannot work out why it won't come on.

I asked my friends at college and they said try the on-off switch. Where is the on-off switch? I have looked all over my computer, but I can't find it anywhere.

*Ian Sutherland, Gorelston (*I might have guessed – Tech Ed*), Gt. Yarmouth*

• Who is this guy? Is this an April Fool's joke, or what? OK. Just in case you are a poor schmuck who doesn't know where the on-off switch is, try looking at the power supply. Jeez, where (or more to the point: why...?) do we get 'em.

TIP
Brother cable

With reference to Andrew Richardson's letter about the Commodore 64 and the Brother HR5, it *is* possible to connect the two with just a cheap cable. I got mine for just £15 from GL systems, but these cables cannot be used without a driver, so listings etc., are not possible (*Then what's the point? – Tech Ed*). Not all software is compatible either. York Electronic Research (0904 610722) supply one with driver software for £18.99. The cables will work with any Epson compatible printer. By the way, if you're finding HR5 ribbons a bit expensive, then W.H. Smiths sell single sheets of white A4 thermal paper for just £5.50 for a packet of 100 sheets – fantastic value!

Paul Davey, Pontypool, Gwen

TIP
Microhelp

Problems with microdrives (*...and there are lots – Tech Ed*) are almost invariably due to oxide forming on the (double sided) edge connections of the main p.c.b. (*Printed Circuit Board, to the uninitiated – Tech Ed*). I have had no trouble since adopting the rather unorthodox solution of smearing the connector pads with 3-in-1 oil occasionally.

The fixing screws on Interface one can be left undone, to facilitate access to the p.c.b. A little oil should also be smeared on the microdrive connector pads on Interface one p.c.b.

Some users may not know that a runaway microdrive motor can be stopped by (*...tearing it from the computer and hurling through a conveniently open window – Tech Ed*) entering CAT with no following number.

Hugh Griffiths, Hereford

• The Commodore Amiga: Graphically stunning and arguably the best of all the home games micros – but how do you turn it on?

HELP!
CPC/PC query

At present I own an Amstrad CPC 464 colour system with about one hundred pieces of tape software. I would like a PC based system. Could you suggest a system with which I can also use my colour monitor and software?

Alan Jones, Kilmarnock, Scotland

• Check out my feature all about budget PC systems in this weeks 'ish. If you do buy a PC, write to me again for a circuit which will allow you to connect your Amstrad colour monitor to a PC. I'm afraid you won't be able to use any of your current software with the PC.

TIP
Twice as wide

I am writing to offer an 80-column screen utility for the commodore Plus 4 to Paul Clancy ('ish 20). Please tell him that if he gets in touch with me at the address below, I will send it together with details and instructions.

Kev Bromfield, 14 Queens Road, Budleigh Salterton, Devon EX9 6QJ

HELP!
Apple/Beeb hybrid?

I have recently acquired an Apple IIe computer complete with a Super Serial card. The world of Apple computing is new to me as I have been using my ace BBC model B since 1983.

I have noticed that these 6502 based machines have a very similar version of BASIC. I was wondering whether I could use the Apple as a second processor for my beeb.

I am very interested in programming and would like to increase the speed of my Beeb using another processor. Also, the Apple has two 5.25" disk drives. Could I use them with my Beeb?

Thank you very much and keep up the good work!

Peter J. Cumberland, Epsom, Surrey

• Nice try PJ, but it just won't work. If you want to speed up your programs, then swap the Apple for a good assembler and write your programs using that. Disk drives? Hmmm, the Apple drives have a lot of controlling circuitry built in and probably more trouble than it's worth to adapt for your beeb.

TIP
Loading the 64c

In 'ish 21 you printed a letter from Ron James of Preston, having difficulty loading C64c games.

I too have this problem, and found it was due to two things. The cassette recorder lead being too close to the TV and the C64c being sesitive to tape tension. Try fast forwarding the tape to the end, rewind and try again. I found this cures 99% of tape loading problems on new games.

Alan Johnson, Oldham, Lancs

HELP!
End of the line

At a closing down sale (*oh no! I just know what's coming – Tech Ed*) I bought an Atari PC1 with 640k, EGA, one 5.25" drive (*...it's worse than I thought...*) the lot in fact, or so I thought. (*and now you can't do anything with it, am I right?*) After weeks of inserting MSDOS, extracting MSDOS, inserting GEM... (*edited here to spare the weak of heart*)

Do you know where I can find an interface or connector so that I might use a hard drive?

Harry Harper, Coventry

• Look, everyone out there in consumerland, why don't you just buy the machine that you want, need and can use, rather than end-of-line cheapos and discontinued products from barrow-boys or box-shifters. The Atari PC1 is well made,

• Closing-down sales are great for bargains. Just make sure you end up with something you can use...

TIP Good old stick Supernorm

Here is a useful tip for prolonging the life of the buttons on the 'Competition Pro' joystick (normal black version). These buttons tend to become unresponsive after only a few months use.

All you need is a screwdriver and 2 old retractable ball pens. First (*...send the Aunties out of the room – Tech Ed*) remove the springs from the pens. Undo the four screws at the bottom of the joystick and remove the cover. Place flat edge screwdriver on button (from the inside) and push down gently but firmly – the button should come apart. Now place the spring over the button, and push the button back into place in the joystick. Repeat with the other button then reassemble joystick. By fitting your buttons with springs, they will last longer and can't be pressed accidentally.

Norm Tierney, London

reliable and a fine machine – *if* it can do what you want it to (as with any machine).

As for expansion boxes, I'm afraid I haven't been able to come up with any details, but if anyone reading this knows of an interface to connect a hard drive then please let me know and I'll pass on the info.

TIP
Interface solution

In response to Mr. Richardson's interface problem (*Express* 'ish 20), I suggest the Centronics interface supplied by Stack/Meedmore. The cost is £12 for the cable and driver software on disk and tape. Meedmore can be contacted at:
28 Farriers Way, Netherton, Merseyside L30 4XL. Tel: 051 521 2202.
James Graham, Princes Risborough, Bucks

HELP!
Smaller drive

I'm just about to purchase an Amstrad PPC512 portable. It has a built-in 3.5" disk drive. The problem is I've got some software on 5.25" disk – how can I use it? Is there a 5.25" disk drive available for it? If so how much is it and where can I get one? Is there a company anywhere who will transfer my software without breach of copyright?
J R W Snape, Blackburn, Lancs

• Most of the software available for the PC and its compatibles is available on 3.5" floppy as well as the more widely used 5.25" format. If you find that a particular package does not come with a 3.5" disk in the box, then try telephoning the software house responsible. They may be persuaded to exchange your 5.25" disks for 3.5" versions. Amstrad is about to release an expansion box which will allow the connection of sveral PC expansion cards, thereby allowing you to connect a 5.25" drive.

HELP!
MSXasperating

Please can you help me. I bought a Spectrum 128 +2 and a Tandy printer DMP106. The cable is the RS232 serial printer cable.

I would like to use the printer with an MSX XH-10 and that's when my trouble started. I have tried a flat parallel cable and a round 14-pin to 36-pin. With the flat cable I can LLIST and LPRINT but all I get is graphics. Changing the dip switches I can print Xs.

Is it possible that I have to change the baud rate as I do for the RS232? I can't get the MSX to change the baud rate.
Allan Pike, Selby, North Yorks

• Baud rates only apply if you are using serial communications. All I can suggest is that the printer has a dip switch to toggle between parallel and serial modes. Do you have a manual for the printer? Try looking for any information regarding the use of parallel signals to drive the printer.

• Amstrad's PPC comes with a 3.5" drive – but what about 5.25" software?

Win a sub!

We want to hear your problems, but we also want helpful hints and tips. And reports of those bugs you've found, from the comical to the downright frustrating. You could scoop the weekly best-tip prize of a brilliant piece of software for your machine, or even a free 26-issue subscription!

And remember, there's no waiting around for monthly publication dates. The best tips, and solutions to your problems will be in print before you can say Alan Sugar. (Please don't send SAEs for replies, we can only answer enquiries in print).

So whether it's help offered or needed, write to: Tech Tips, New Computer Express, 4 Queen Street, Bath, Avon BA1 1EJ.

TIP
C64 digitiser

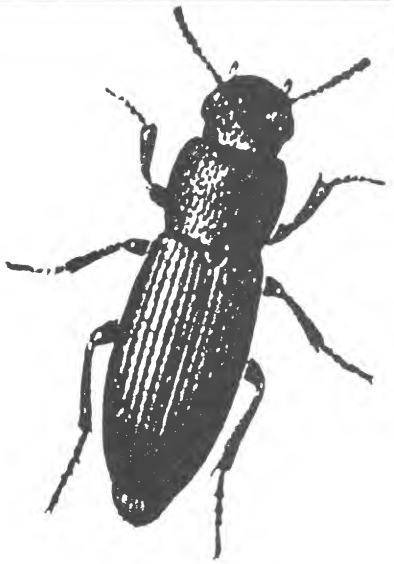
In *Tech Tips* (*Express* 'ish 21) you featured a letter from Adrian Sharp enquiring about a video digitiser for the Commodore 64.

It so happens that I have such a digitiser which I no longer use and software which saves or converts digitised screens to various formats for use in several paint packages (*Koala, Art Studio, Printshop* etc)

I would be happy to flog this to Ade for a modest (!) sum.
Ian Anderson, 9 Lorn Avenue, Chryston, Glasgow G69 9LY

BUG OF THE WEEK

The Z88 comes with a good implementation of *BBC BASIC*. Unfortunately, there's no line editor. If you want to edit a BASIC listing you have to mess around with it in *PipeDream*. The manual describes how to do it, but it's extraordinarily time-consuming. Not exactly a bug, more a constant source of frustration.
Hon. Basil Pigg



• Tribolium confusum
Four species of this genus occur in central Europe. Single beetles are occasionally found in the open, e.g. in powdered wood in old hollow trees, but normally they are confined to the interiors of small portables. Here, they graze peacefully on small pieces of machine-code.

HELP!
Jargon busting

Congratulations on such an interesting and informative (but short!) section.

I recently bought an Atari ST which I am extremely happy with, but as I am new to 16-bitting (Fnarr, Fnarr), I am having a little bit of bother with the much wider jargon connected with them. I'm sure other learners are also confused. There are a few things I would like to know:

1. What is a blitter chip?
2. What is a RAM disk?
3. What are MS-DOS and CP/M? (and which is best?)
4. Is there a BBC emulator available or a comal language disk
5. What is the Phillips 8833 monitor like and would you class a monitor as an essential peripheral?
6. How capable are *PC-Ditto* and the *Aladin Mac* emulator?

Many thanks and keep up the good work.
Stuart White, Strathclyde, Scotland

• **1.** The word Blitter is an acronym for Block Line Transfer. The chip moves around whole blocks of 'screen lines' rather than individual pixels, thereby speeding up the process of displaying and animating graphics.

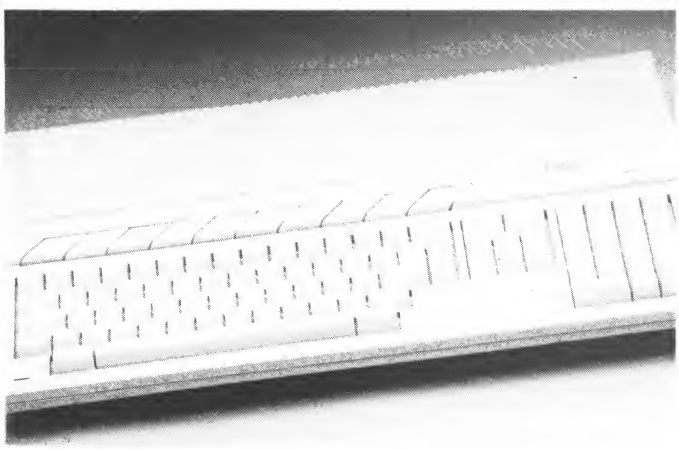
2. A RAM disk is – as its name suggests – a portion of spare RAM which is set aside for use as a fake disk drive, i.e. the operating system of the computer treats the portion of RAM as a real disk drive. The only thing to remember is to save the contents of the RAM disk before switching off the computer, otherwise all will be lost!

3. MS-DOS and CP/M are operating systems used by 8088/8086 (IBM-PC and compatibles) and Z80-based micros respectively. MS-DOS stands for MicroSoft Disk Operating System. CP/M stands for Control Program for Micros.

4. Yes, a BBC emulator is available in the public domain. Try Softville PD Service on 0705 266509.

5. The Phillips monitor is a good quality and reasonably priced VDU. Monitors are essential if you are going to use any 'serious' software, such as a wordprocessor or spreadsheet.

6. Both the emulators you mention are VERY capable. *PC-Ditto* is a little slow but works fine with all the well-known PC software packages. The Aladin gives a larger screen display than the Mac and runs Mac software up to 20% faster!



• Can you emulate the PC and BBC on the Atari ST? And what are RAM disks, blitter chips and what's the Philips 8833 monitor like and...

clik-ST

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FREE! MONTHLY Atari ST disk magazine send sae and blank disk to David Dean, 1 Alton Grove, Newport, Shropshire, TF10 7JF 0952 820215

AMSTRAD CPC6128 green monitor, Panasonic printer, Silicon disk, software, books, magazines – cost £950, sell £420. Tel Belfast 0232 752297

AMIGA SOFTWARE, Menace, Aaargh!, Virus, Ferrari formula one, Operation Wolf, £70 No offers. No splitting. Tel 01 202 7068 evenings only

FOR SALE computer magazine personal computer news 1983 – 85 all bound 82 copies £15 01 204 3918

ANY PROGRAMS or routines you want programmed for your C64 send details of what you want and I'll program them. (0206) 46582

QL INTERNTIONAL cricket £4.99. 128K and 256K versions. Big animated sprites, 2 player option. Telephone Nigel Holder on 0706 39554

BRIGHT PICTURE with your ST/HC01/05 set up? For free help sheet please send SAE C Parker, 14 Cross Lanes, Pill, Bristol 027581 5242

AMSTRAD CPC disk software – hisoft 'C' £15, Gemini 'Office Master' £8, Database 'Planit' (personal accounts) £8 Phone George 0924 – 822778

64C NEW still boxed. 1541C disk drive. Brother HR5 printer numerous disks games cartridges bargain £250. Phone 01 883 3218

ATARI ST – Ocean's where time stood still, original game, only £10. Contact Llanrwst (0492) 641203 between 5pm-9pm ask for Emyr.

MEGA AMIGA owner wishes to contact those in England to exchange tips graphics etc. Please call Dave on 01 467 7578

HAVE YOU completed a programming Masterpiece? If so send your finished games to: P Downey, Fairbanks, School Lane, Greak Leighs, Chelmsford, Essex, CM3 1NX (0245) 361 471

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● Domark's back with a vengence this week, with two solid releases – *Typhoon Thompson* and *Vindicators*. *Sanxion* from Thalamus wasn't that bad either.

The rest had us running for cover and, in the case of *Arnhem*, – the dustbin. Nice one Fieldy!

VINDICATORS

TENGEN/DOMARK

ST • £19.99dk
Also on Spectrum, CPC
Out soon on C64, Amiga, PC

• Tanks for the memory

***Vindicators* is the first coin-op conversion on the Tengen/Domark label, so does it justify purchase?**

● **GAMEPLAY**

All tanked up, with everything to blow! You're in control of your SR-88 Battle Tank and must destroy the control centres of 14 alien space stations. Along the way you'll have to avoid tanks, cannons and force fields in your thirst for total annihilation.

You "can get a little Xtra help" by collecting Battle Stars during the game, and trading them for extra weaponry and powers at the end of each stage.

● **GRAPHICS AND SOUND**

Although the backdrops and sprites have been well converted, this has been negated by jerky scrolling and sluggish movement. Audio consists of a thumpy, throbby sampled soundtrack on the title page, plus the standard offering of sound spot-effects in-game.

● **OTHER VERSIONS**

We've only seen pre-production demos of the other versions of *Vindicators*, but they looked much the same as the ST version – let's hope their speed is a little faster.

● **EXPRESS VERDICT**

Vindicators is visually faithful to its Atari coin-op parent, but its lack of fast-paced action lets the gameplay down badly. However, for twenty sovs it's worth a quick butchers, guv – especially if you developed peak-level neural/sensory enjoyment when jacking into the coin-op.

✪ ✪ ✪

Rik Haynes

• Life on the ocean wave (ripple)

• Cute – but weird

TYPHOON THOMPSON

DOMARK

ST £19.99dk
Other versions planned

***Typhoon* comes from Dan Gorlin, the man who brought you the 8-bit hit *Choplifter* back in '82. Mastered on an Apple 2, this Teheran Embassy Siege simulator actually found its way onto coin-ops! *Typhoon* looks like it might attract a captive audience too.**

CUTE GRAPHICS

● **GAMEPLAY**

File under Wacko. Piloting an amphibious jet-sled across an ocean world, your quest is to locate several tools to free a baby from its Sea Sprite guardians. You visit clusters of islands where you must fire a range of weapons to release the sprites from a diverse range of defences.

After collection you deliver them to a Treasury Dome and pick up a tool. You then progress to another cluster after dropping off your prize to the Sprite Guardians, who give you new weapons in return.

Each level involves various chases around the island villages until all Sprites are collected and exchanged for the four artifacts needed to complete the mission. It all sounds pretty simple and easy, if not a little surreal, until you find yourself tracking literally dozens of Sprites that turn into flying fish if you don't collect them in time. And of course there are various defences designed to make the quest more difficult. Their names – Bumpers, Whompers, Forcers, Suckers, Bubblers, Spitters and Zappers – should give you some idea of what to expect but you can dive under the surface when things get too hot.

So, we're talking straight shoot-'em-up strategics but what pulls *Typhoon* out of the crowd is the graphics.

● **GRAPHICS AND SOUND**

Although *Typhoon Thompson*'s sprites are pretty minuscule this doesn't detract from the fabulous animation on view or the smooth eight-way scrolling. Combining these with detail, colour and speed injects gameplay with a freshness the scenario would appear to lack. End of level animated sequences are great, with frame speed fast enough to supply convincing cartoon action. Sound is somewhat disappointing, since spot-FX are uninspired.

● **OTHER VERSIONS**

Plans are a little sketchy for other format releases – it depends on how ST sales go.

● **EXPRESS VERDICT**

Cute is the word that comes to mind. Cute cut with an addictiveness that creeps up on you. *Typhoon Thompson*'s not going to have you rushing out to buy it until after the word gets round.

✪ ✪ ✪ ✪

Andy Storer

SANXION

THALAMUS

Spectrum • £8.99cs
Also on C64

Some three years after its parent arrived on the C64 comes Spectrum *Sanxion*. Has it been worth the wait?

● **GAMEPLAY**

Nothing original here, as you plough through hordes of alien sprite attack formations in this horizontally-scrolling shoot-'em-up. To keep the interest going you can multi-view the action from above or sideways, depending on your preferred slant in life.

● **GRAPHICS AND SOUND**

Sprites and backdrops are highly-defined mono representations, which work well thanks to fast – but smooth – scrolling and animation. Audio isn't that bad, with identifiable renditions of the C64 soundtracks and reasonable – albeit scarce – sound spot-effects during play.

● **OTHER VERSIONS**

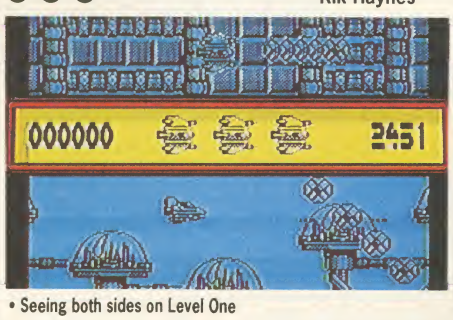
C64 *Sanxion* was the first game by a Finnish programmer, Stavros (innit, peeps) Fasoulas, who went on to produce *Delta* and *Quedex* until being drafted into national service. Containing smooth, fast and colourful visuals and a superb Rob Hubbard loading soundtrack, *Sanxion* can now be found on the Rack-It budget label for the bargain price of £3. With Spectrum owners having to wait three years for their version of *Sanxion*, who knows if or when there's going to be a CPC version? And definitely don't hold your breath for *Sanxion* on the MSX.

● **EXPRESS VERDICT**

Sanxion on the Spectrum is authentic to the C64 original, but suffers from being slightly too difficult to play. Of course, many seasoned Spectrum gamesters should be able to take up the challenge *Sanxion* provides...

✪ ✪ ✪

Rik Haynes



• Seeing both sides on Level One

THE RUNNING MAN

GRANDSLAM

Amiga £19.95dk
Also on Spectrum, C64, CPC, ST, PC

You've read the Stephen King novel. You've seen the movie. Now you can play the computer game, thanks to the guys at Grandslam.

GREAT DEMO!

• About to go on air

● GAMEPLAY

You take on the sprite of Arnold Schwarzenegger in this futuristic TV game of epic rating proportions. Hunted by such freaks as Subzero, Buzzsaw and Dynamo you must travel the depths of the "Game Zone" looking for love, health and the odd weapon or two. After all, you can run but you can't hide!

● GRAPHICS AND SOUND

The Running Man contains one of the best intros we seen on any game, with an assortment of animations using digitised images and sampled speech extracts from the movie. It's therefore a pity the rest of game contains average in-game audio-visuals which do nothing to enliven the inadequate gameplay.

● OTHER VERSIONS

We haven't seen the other versions yet, although the thought of audible sampled speech on the PC kept us amused for all of 0.225446034 nanoseconds.

● EXPRESS VERDICT

The Running Man's asking price of £20 is a lot of money to spend on a demo, considering you could buy better examples of the genre for a meagre £3 per disk.

Amiga owning Arnie-fans should restrict their Schwarz-burger entertainment to the movie, 'cause you get about the same level of interaction from watching the video as you do by playing the game.

Keep on Running? You better believe it.

✪ ✪ **Rik Haynes**

• In the game: Suffering canine harassment in front of the TV cameras

ARNHEM: THE MARKET GARDEN OPTION

CCS

PC • £19.95dk
Also on Spectrum, CPC
Out soon on ST, Amiga

Tactical wargaming fans now get to refight one of World War II's more celebrated battles on their PC, courtesy of CCS.

● GAMEPLAY

The spiel on the package indicated that the hapless player would "experience...bitter conflict..." True – by trying to play this game!

You begin by choosing one of five possible scenarios: Advance to Eindhoven, Operation garden, Operation market, The bridge too far and Market garden. Typing in Advance to Eindhoven, for example, rewards you with a screen looking like a road accident and a number of coloured blocks bearing symbols intended to convey to a jaded reviewer's mind the massed ranks of a tired but heroic army.

Gameplay? Well, during your turn, you issue orders to each coloured block, er, sorry, battallion until all your troops have been deployed. You hear a few squeaks and grunts whilst the computer playing the opposing side makes its moves and then it's back to you again, deploying hither and thither. And so it goes on – ad infinitum or until one side loses (it always feels like it's you who's lost).

• A map of the area, and no vegetables in sight yet

● GRAPHICS AND SOUND

If the abstract works of Jackson Pollock turn you on, then you'll thrill to the main display. Lurid coloured blotches reminiscent of a tropical disease are the order of the day.

Sound? A few grunts and whistles but nothing to write home to Ma about. OK, this is not meant to be a shoot-'em-up (not in the accepted sense anyway), but the odd victory march, or decent explosion would have helped to create atmosphere.

● OTHER VERSIONS

Already out on the Spectrum and CPC, with ST and Amiga versions to follow.

● EXPRESS VERDICT

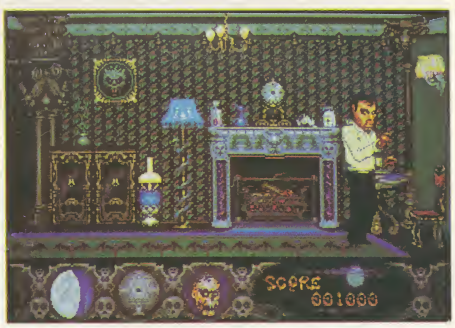
Our copy made a satisfying clunk as it struck the dustbin. Remember, we get review copies for free – you'd have to pay for this junk – avoid it.

✪ **Field Marshal Mellish**

FRIGHT NIGHT

MICRODEAL

Amiga • £19.95dk
Due out on ST



• Nice audiovisuals, shame about the gameplay

Remember the film? Neither did we, but we thought we'd have a look at the game anyway. Because with gameplay by Master of the Scrolls Steve Bak and graphics by Pete Lyon you might be expecting something special. You'd be...er...

● GAMEPLAY

Using a joystick, you play the role of Jerry Dandridge, a modern day vampire who has twelve hours to bite the living daylights out of anything that moves. This involves wandering around the rooms of a mansion, dodging the crosses, garlic and holy water thrown by your intended victims before sinking your teeth into their jugulars. Sucking blood allows you to maintain your death-force long enough to survive until daylight. Clear a level and it's onto the next, where more rooms open up for you to explore. If you take too much time, your death-force dwindles rapidly and you eventually enter a state of non-existence. Game over.

● GRAPHICS AND SOUND

Both the visual and audio aspects of *Fright Night* are superb. The varied, colourful backdrops are expertly drawn and the accompanying music and spot-FX compound the sense of atmosphere well making full use of the Amiga's stereo sound capability.

● OTHER VERSIONS

An outing on the ST is due for imminent release but is as yet unseen.

● EXPRESS VERDICT

Although *Fright Night* looks and sounds great, its gameplay – and here you have to remember it's a game about biting into necks and drawing blood – sucks. There's simply not enough variation in play, other than more of the same, and even then what's there isn't terribly difficult. For a release delivering so much audio-visually, there's nothing here to get your teeth into.

✪ **Andy Storer**

Money is everything!

Rik Haynes ponders whether blood will have blood by previewing the latest from Psygnosis

BLOOD MONEY PSYGNOSIS

Programmed by the same team that brought us *Menace* comes *Blood Money*,– a shoot-'em-up featuring over 1 Meg of graphics data and a 400K sampled soundtrack. *Blood Money* offers simultaneous two-player action, four alien safaris and the option to buy extra weaponry as you strategically blast everything in sight. *Blood Money* is out later this month at a rather hefty £30.

SUPER STUNTMAN CODE MASTERS

Racing round the film-set in your Ferrari GTO, Powerboat or Turbo Chopper, you have to complete seven film stunts for a blockbusting movie in this, the latest epic release from Code Masters. *Super Stuntman* (simulator?) is out shortly on ST and Amiga.

SHINOBI MELBOURNE HOUSE

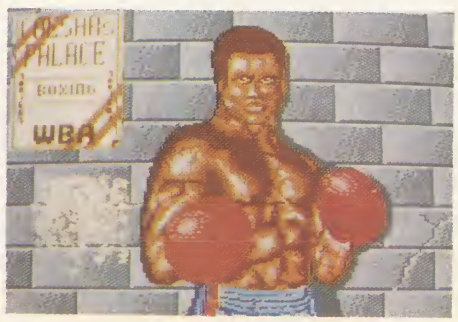
As a Ninja Master, you must take on The Ring of Five terrorist network, which has kidnapped the world leader's kids and stashed them away in five separate locations. Your success will depend on clever use of your shuriken, sword and nunchaku state-of-the-martial-arts weaponry – and the odd, well placed headbutt here or there. Out sometime on Spectrum, C64, CPC, ST, Amiga and PC, fans of Shinobi will have to feed their addiction to the game by either playing the coin-op, buying a Sega games console or watching the Depeche Mode *Everything Counts* '89-mix video!

RUN THE GAUNTLET OCEAN

No, not another four-player maze game incarnation, *Run the Gauntlet* is a TV licensed game centred around the adventurous, but tiring, tasks of multi-machine assault courses. In-game hardware includes jetskis, hovers, speedboats, inflatables and buggies as you try to run down the inane commentator! Released on Spectrum, C64, CPC, ST and Amiga.

RINGSIDE EAS

Not enough boxing on the TV lately? Well *Ringside* could redress the balance when it's released shortly on the C64. As an eager young boxer itching for the World Title, you must train hard and play rough as you punch out ten contenders in this German boxing-sim.



RENEGADE III IMAGINE/OCEAN

Renegade III is the third (believe it or not) in a trilogy of martial arts kick-'em-ups, placing you in the aforementioned role of "Renegade". This time, you're up against a time-warp compilation of medieval, ancient Egyptian and prehistoric opposition in your never ceasing quest to get your girlie back from The Forces Of The Future. Already out on Spectrum, C64, CPC, with ST and Amiga versions to follow.

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Access

The hotware revolution

A terrifying vision of the future from Dave Langford

The end of the world came in the late 1990s, when the entire nuclear industry was deregulated and privatised. Unfortunately for the political theorists responsible, the dynamic entrepreneurs who rushed into this new boom area proved to be the same ones who for years made the home computer business such a joy...

"Expansion, squire, that's what you have to think about. 'S an investment. You don't want to be trading it in for a bigger model next month, do you? OK, right now you think five hundred and twelve megawatts sounds an awful lot. That's what they all say before they get hands-on experience. Hook up a few add-ons, though, a few extra cookers and central heating systems, a bit of light industrial plant, and you'll soon see it would have made sense to get the best you could... And don't forget the summer special offer. Heat exchanger, three-phase generator and half a mile of barbed wire fence bundled absolutely free!"

"Hello, this is Megabuck Hotware, can I help you? *Support*? You want...support? I'll see if Maisie knows anything about that. It's urgent? A radioactive cloud spreading down your back garden? I'm sorry, sir, the switchboard can't handle hardware queries..."

"Blimey. No wonder you've got problems. Fancy trying to run your business with a clapped-out old British Bequerel Corporation system... I don't *care* what it cost, it's not wossname, not International Breeder Manufacturers standard, is it? Shouldn't have bought an enthusiast's machine like that. Even if they do both take five-and-a-quarter inch fuel rods, the threading's different."

"Leaking? We sell two hundred of these plutonium reprocessors every month and we've never had *that* complaint before, sir. I'll pass it on to head office, but are you certain you've followed the proper start-up procedures in the footnote on page xiii of Appendix C in the user manual supplement? ...Well *read* the sodding manual! Honestly, some people... In Swedish? Yeah, well, a few went out in Swedish, but we've got a new edition on order now."

"No trouble. For full technical backup, call our 24-hour hotline number. Er, yes, it *is* in the USA – Three Mile Island Support Services Inc – I'm sure they'll suss your problem in no time."

"Sorry, sunshine. When you fixed the crack in the fission chamber with superglue, it no doubt worked very well for you and I'm sure you're proud of your cleverness, but you've Invalidated The Warranty. No user serviceable parts, it says right there on the shielding. You want to add a medical irradiation facility, you let the professionals do it. Like I said, I'm sorry but there it is. Can't lift a finger now, not even if the kids do all glow in the dark."

Magazine review, 1999: "*New Release!* Ian Sinclair's comprehensive guide *OS/2 Reactor Decommissioning Techniques Made Easy* has scored a first even for this remarkable writer, by appearing months before the hot new OS/2 reactor has been officially confirmed as "to be announced". Nevertheless, this useful handbook will be a must for anyone faced with that familiar problem of decommissioning a major r/a hazard in the back garden or spare room. A handy periodic table of the elements is included as an appendix."

"Yeah, well, that's a popular machine all right, but of course it's slow. AmRad cut their costs with graphite-pile technology, and those three-inch fuel rods are specially enriched: that's why they're so expensive, don't blame the dealers. We can do you a transformer to link your AmRad to the same power grid as an industry-standard Pressurized Containment system, though. Sit down before I tell you the price."

"Of course, a go-ahead magazine like *Personal Nukes* hasn't got space for articles on the sort of hotware you pathetic home users can actually *buy*. We're talking fifth generation here. Laser enrichment, 80486-gigawatt fusion technology, and there's a good chance it'll all be working in the early 2000s..."

"Never, never, never put a strange fuel element into your personal reactor! Without wanting to be alarmist, I must warn you that some shareware rods are reported to be infected with the Armageddon Catalyst which on 1st January 2000 will vaporize, blow holes in your shielding, erupt in a thermonuclear fireball and precipitate global holocaust. There is also the Pedantic Armageddon Catalyst which will do the same a year later, on 1st January 2001, for users who are fussy about when the millennium *really* ends. Fortunately, I can offer a complete protection system for only £15 plus VAT..."

"I'm sorry, I'm going to have to put you on hold. Yes, we do have fifty-two support lines but they're all engaged. No, I'm afraid I'm *not* qualified to give information about melt-downs. In any case our warranty is limited to replacing the faulty product." (Cut to sound of "On Hold" music, Vera Lynn singing "We'll Meet Again.")

...Thus the hotware boom followed lines familiar to any computer sufferer. It was a great pity that when one big-name company finally released the exciting new fissile material handling system which had been hyped since 1996, they found that – most embarrassingly – one of those little hardware glitches made the new product incompatible with the continued existence of the human race. But free replacements and upgrades were promised at the earliest possible date.

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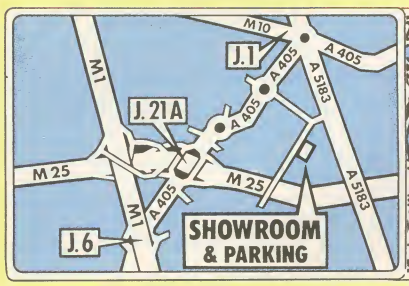

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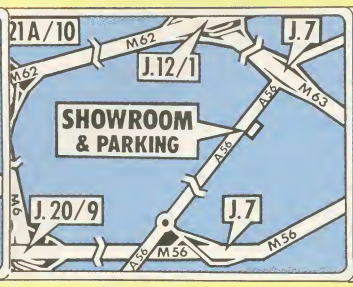

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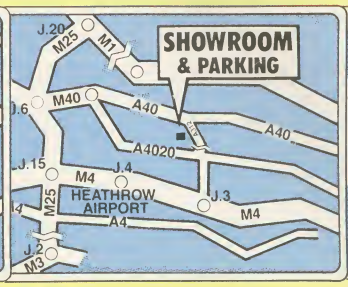

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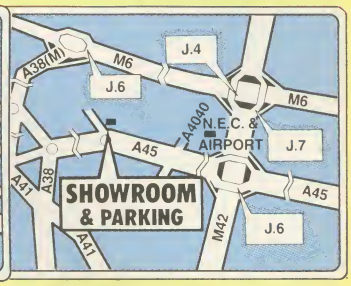

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